

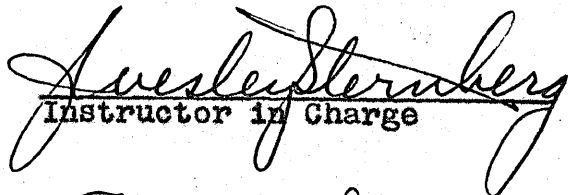
THE CONCENTRATION TENDENCY IN THE AUTOMOBILE INDUSTRY


by

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## PREFACE

The size of the average establishment in almost all the important industries of the United States has increased during the last quarter century. In some industries this increase has been rapid, in others quite gradual; but with few exceptions it is apparent in all. The aim of this study is to determine as accurately as possible the degree to which the tendency toward concentration has been effective in the automobile industry and also to discover the causes which have been responsible for it.

Much of the statistical material of Chapter II would have been unavailable without the fine spirit of cooperation shown by the National Automobile Chamber of Commerce, the Automotive Division of the Department of Commerce of which Mr. Percy Owen is Chief, and the statistical departments of various leading concerns in the industry. This cooperation has been very much appreciated.

Finally, the writer wishes to acknowledge the valuable criticisms and suggestions of Associate Professor J. Wesley Sternberg under whose direction this thesis has been written.

University of Kansas

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## CHAPTER I

### BRIEF SKETCH OF THE DEVELOPMENT OF THE INDUSTRY

Although this study is primarily concerned with only one phase of the automobile industry--the tendency toward concentration--it seems best at the outset to present an abbreviated sketch of the development of the industry to its present status. A general perspective of the whole will serve to furnish a better background for the consideration of a special phase.

The most striking fact that a general survey reveals is the tremendous rapidity of growth. The automobile industry has expanded from its rude beginnings to the rank of the largest of the manufacturing industries as measured by wholesale value of product in little more than one generation.<sup>1</sup> The first United States Census report on the industry<sup>2</sup> appeared in 1899 according to which only 3700 motor vehicles<sup>3</sup> were produced, valued at \$4,748,011. Capital invested in that year was but \$5,768,857 and the average number of wage earners was 2,241. The figures of the record production year, 1923, present

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1. Biennial Census of Manufactures, 1923.

2. The automobile industry as used in this thesis refers only to the production of passenger cars and trucks unless otherwise specified in the context. It does not apply to the production of bodies and parts.

3. The term "motor vehicle" is used to include both cars and trucks and is synonymous with the term "automobile."

a striking contrast. In that year 4,086,997 motor vehicles were produced, the wholesale value was placed at \$3,163,327,874, the capital invested was \$1,571,722,411, and the average number of wage earners was 241,356.<sup>1</sup> Stated more graphically, production in units in 1923 was 1104.6 times that of 1900 and value of product was 422.3 times as great. This tremendous increase was effected by a capital investment of 272.4 times as many wage earners.<sup>2</sup>

A history of the development of any industry divides itself roughly into three stages: (1) the period of uncertainty and experimentation; (2) the period of growth and exploitation; and (3) the period of maturity or stability. It is obviously impossible and unwise to attempt to define absolutely the periods in any given industry which correspond to the above classification since one period merges into another by almost imperceptible gradations. However, no harm is done in attempting to approximate roughly the periods if it be understood that they are meant to indicate the predominance of the characteristics of the stage to which they correspond. On

1. Data from Table 1, p. 6

2. Incidentally, it is interesting to note from these figures the increase in production efficiency. In 1899 the capital investment per unit produced was \$1,559.15 and 1.6 cars for each wage earner employed were built; in 1923 the capital investment per unit produced was \$384.56 while 16.9 cars were produced per wage earner employed.

this basis it would seem that the development of the automobile industry might be quite properly divided thus: (1) period of uncertainty and experimentation, 1899-1908; (2) period of growth and exploitation, 1909-1923; and (3) period of maturity or stability, 1924---

#### The First Period (1899-1908)

Three main problems confronted the industry in the initial stage of its development: (1) the mechanical perfection of the product to the point of practicability, which was of course mainly an engineering problem; (2) convincing the public that the product offered a reliable and desirable means of transportation, or creating the demand and educating the public to recognize the practicability of the product; and (3) raising the capital necessary to finance production.

The struggles and sacrifices of the early pioneers present a wealth of romance. Their belief in the future of the industry led to ceaseless endeavor, successful and unsuccessful, which ultimately saw its establishment. Charles E. Duryea, Elwood G. Haynes, Elmer and Edgar Apperson, Henry Ford, H. H. Franklin, and R. E. Olds may be mentioned as the outstanding early leaders or pioneers.



The credit for the first automobile is usually given to Elwood G. Haynes who later became the President of the Haynes Automobile Company of Kokomo, Indiana. The car was completed and given its trial trip on July 4, 1894. The mechanical work was done by the Apperson brothers who at that time operated the Riverside Machine Works at Kokomo. There is, however, considerable controversy over whether this credit should be given to Haynes or to Charles E. Duryea. It is the claim of the latter that his first car was finished in October, 1892, and he has gathered much data to support this claim. The mechanical work on the Duryea car was done at the shop of John W. Russell and Sons in Chicopee Falls, Massachusetts.<sup>1</sup> However, the settlement of this controversy is not of particular moment. The essential fact here is that the crude beginnings of the automobile industry date back to the early nineties.

The industry was just emerging from the machine shop stage about 1900. Prior to this time few if any concerns had attempted to formulate anything like a production schedule. Most machines were of the hand-

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1. Automotive Industries, June 10, 1920, p. 44.  
     Ibid, July 15, 1920, p. 146.

tailored type, each supposed to be an improvement over the previous one.<sup>1</sup> Standardization was yet to be developed. Several companies which later played a prominent role in the industry appeared about this time and production began to take on a more systematic aspect. It has been previously stated that the Bureau of the Census collected its first data in 1899.

The Olds Motor Works was incorporated in 1899 to succeed the original company, the Olds Motor Vehicle Company, incorporated in August, 1897. It was the largest producing concern at that time and in 1900, 1,400 cars were manufactured. The Packard Motor Car Company appeared in 1900 and the Winton Company was on a producing basis prior to that year. The Haynes Automobile Company was incorporated in May, 1898, and the Locomobile Company of America was organized in 1899. The articles of incorporation of the H. H. Franklin Manufacturing Company, incorporated in December, 1895, were changed in 1901 to include the manufacture of automobiles. The Thos. B. Jeffrey Company appeared in the same year. In 1903 the Auburn Automobile Company was organized; and also in June 1903, the Ford Motor Company, later destined to

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1. Automobile Trade Journal, Dec. 1, 1924, p. 285.

TABLE 1

## General Statistics of the Automobile Industry -- 1899-1924.

Year	Production <sup>†</sup>	No. of establish- ments <sup>*</sup>	Ave. No. of wage <sup>*</sup> earners <sup>*</sup>	Wholesale value of product <sup>†</sup>	capital invested <sup>*</sup>	Registration <sup>†</sup>
1899	3,700	57	2,241	4,748,011*	5,768,857	8,624
1900	5,000					13,824
1901	7,000					20,590
1902	9,000					28,755
1903	11,000			12,650,000		38,083
1904	21,975	121	10,239	26,645,084*	20,555,247	57,864
1905	25,000			40,000,000		77,988
1906	34,000			62,900,000		106,928
1907	44,000			93,400,000		142,051
1908	65,000			137,800,000		197,479
1909	130,986	265	51,294	193,823,108*	134,592,965	311,197
1910	187,000			225,000,000		468,497
1911	210,000			262,500,000		639,514
1912	378,000			378,000,000		944,000
1913	485,000			425,000,000		1,258,062
1914	569,054	300	79,307	503,230,137*	312,875,884	1,711,339
1915	892,618			691,778,950		2,445,666
1916	1,617,708			1,088,028,273		3,512,996
1917	1,868,949			1,274,448,449		4,983,340
1918	1,153,638			1,236,106,917		6,146,517
1919	1,974,016	315	210,559	2,387,903,287*	1,310,461,400	7,565,446
1920	2,205,197		244,700 <sup>†</sup>	2,232,927,628	1,204,378,642 <sup>†</sup>	9,231,941
1921	1,661,550	385	143,658	1,671,386,976*	1,423,500,000 <sup>†</sup>	10,463,295
1922	2,659,064		253,104 <sup>†</sup>	1,789,638,365	1,456,649,954 <sup>†</sup>	12,238,375
1923	4,086,997	351	241,356	3,163,327,874*	1,571,722,411 <sup>†</sup>	15,092,177
1924	3,617,602		329,563 <sup>†</sup>	2,328,066,004	1,691,050,112 <sup>†</sup>	17,591,981

<sup>†</sup> Figures by National Automobile Chamber of Commerce.

\* United States Census Reports.

occupy such a dominant position, was incorporated. Other concerns which made their appearance about this time might be mentioned, but enough have been cited to indicate clearly that confidence in the future of the industry was rapidly extending to the capitalist class.

Consultation of Table 1 on page 6 shows that throughout the first period the industry experienced a continuous growth from year to year. Production increased from 2700 units in 1899 to 130,986 in 1909, the number of establishments increased from 57 to 265, the average number of wage earners increased from 2,241 to 51, 294, the wholesale value of product increased from 5.8 millions to 134,6 millions. The period of uncertainty was past. The public had become convinced of the practicability of the product and a sellers' market was destined to obtain for the most part throughout the second period. Confidence in the future of the industry was now manifestly established.

#### The Second Period (1909-1923)

The second stage of development of an industry has been styled above as that of growth and exploitation and the period 1909-1923 has been set off as corresponding roughly to this stage in the automobile industry.

This period was a natural sequence of the firm foundation laid in the one preceding. The way had been paved for an enormous increase of production. Most of the leading concerns of today were organized and in operation prior to 1909. Production schedules were small, it is true, but nevertheless most of the leading establishments of today (1925) were going concerns. Until 1921, the year in which the number of establishments reached the maximum, only 10 more concerns appeared each year on the average.

Several tendencies or characteristics of the second period stand out in relief and should be mentioned although space will not permit of more than passing notice. These may be summarized as follows: (1) standardization; (2) mass or volume production; (3) a general concentration tendency; (4) growth of the foreign market; (5) tendency from open to closed cars; (6) increase in the proportion of the low-priced car; (7) use of the motor truck; and (8) mechanical and aesthetic improvement.

The standardization movement which made possible volume production was launched in 1910 by the Society of Automotive Engineers.<sup>1</sup> It refers both to standardization of processes of production and to standardization of product. The outstanding example of

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1. Automobile Trade Journal, Dec. 1, 1924, p. 293.

this development is the Ford Motor Company which began production of the Model T on a quantity basis about 1910, producing in that year 19,051 cars and trucks.<sup>1</sup> Standardization, volume production, and concentration are tendencies each of which is dependent on the other. It is certain that some degree of standardization of product and processes must precede a marked development of the other two tendencies. However, it is equally true that the necessity for mass or volume production and concentration were the fundamental causes of the rapid progress of the standardization movement.

Chart 1 shows the rate of growth of production and also of registration for the period. The tendency toward concentration will be given consideration in a later chapter.

TABLE 2

Exports of Cars and Trucks from the United States and Canada. 1910-1923.<sup>2</sup>

Year	Cars & Trucks	Year	Cars & Trucks
1910	8,443	1917	80,235
1911	15,807	1918	57,605
1912	23,720	1919	105,679
1913	26,889	1920	194,656
1914	25,765	1921	49,606
1915	65,958	1922	116,192
1916	80,843	1923	221,816

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1. Moody's Industrials, 1924, p. 1985
  2. Commerce Yearbook, 1923, p. 352



## CHART I

Rate of Growth of Production and  
Registration. 1909-1923.

(Based on data in Table 1)

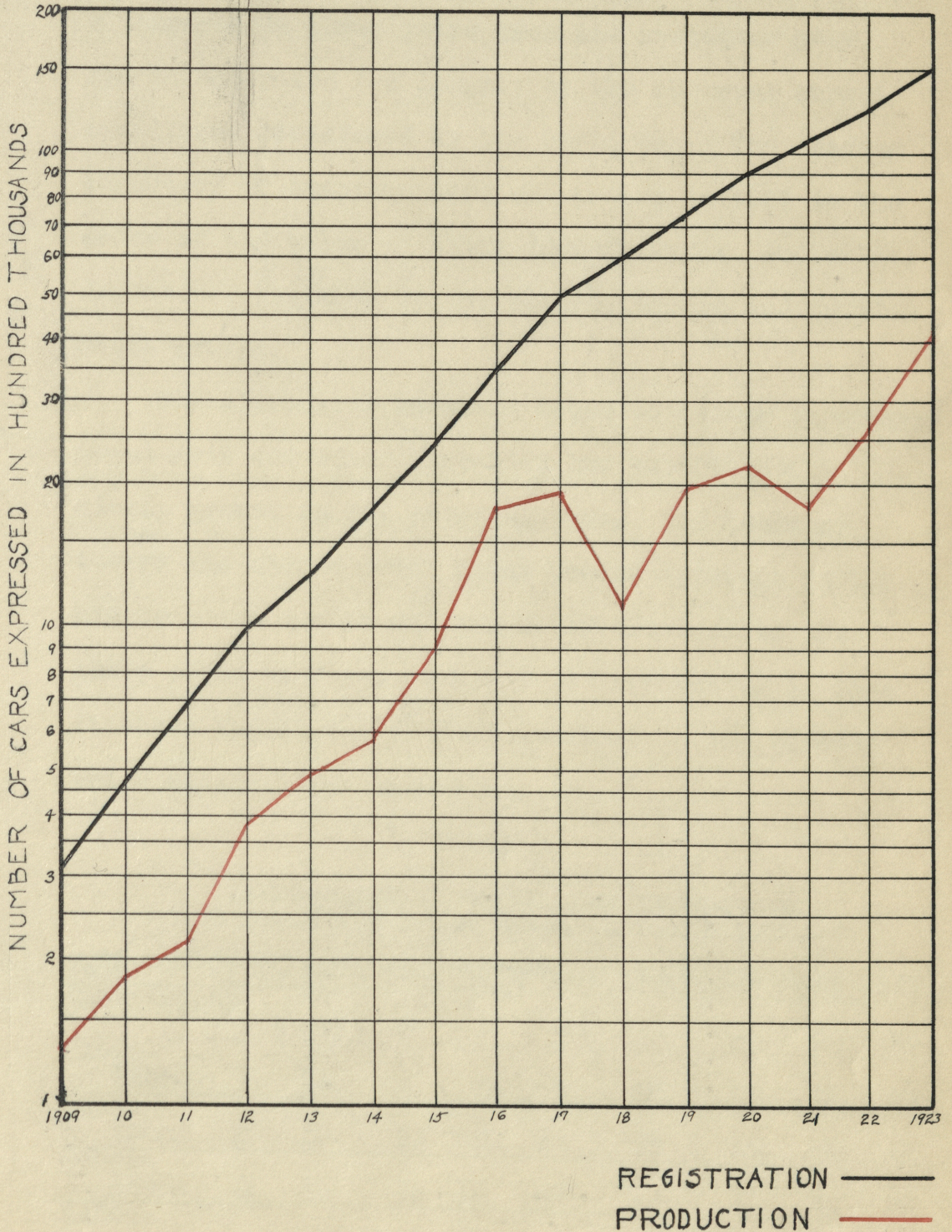


Table 2 shows the growth of the export trade since 1910 which has been constant with the exception of the years 1914, 1917, 1918, and 1921. The setback of exports in these years from the preceding year can be accounted for largely by the abnormal market conditions occasioned by the World War. The leading importers of American cars and trucks in 1923 in the order of the value of their imports were: Australia, Argentina, England, Spain, Mexico, Sweden and British South Africa.<sup>1</sup>

The closed-car movement began to assume importance about 1915 and since that time has experienced a steady growth in all price classes. The tendency toward the closed model first became apparent in the higher price groups and gradually extended to the lower price classes. Table 3 is interesting in that it shows the growth of this movement in the various price classes from 1915-1923.

TABLE 3

Percentage of Closed Car Production  
by Years and Price Classes. 1915-1923.<sup>2</sup>

Year	1915	1916	1917	1918	1919	1920	1921	1922	1923
Under \$1000	1.4	1.4	3	6	9	16	21	26	31
\$1000-									
\$2000	3	4	5	6	8	12	18	29	38
\$2000-									
\$3000	7	10	24	22	24	22	36	39	41
\$3000-									
\$4000	8	10	10	20	27	43	41	44	55
\$4000-									
& over	27	37	33	25	27	30	47	56	60

1. Automotive Industries, Feb. 21, 1924. p. 468.

2. Automotive Industries, Feb. 21, 1924. p. 373.



The tendency toward the increase of the proportion of the low priced car is apparent from a survey of Table 4 which sets forth the percentage of passenger car production allocable to each price class for the years 1912-1923. It is to be noted that cars priced under \$1000 comprised 81.6 per cent of the number produced in 1923 as opposed to 43.8 per cent in 1912 and that this marked increase occurred mainly at the expense of the next higher price group, \$1000 to \$2000. It should also be observed at this point that the closed-car movement has tended to increase the proportion of the higher price classes since that type of car is usually more expensive than the open model.

TABLE 4  
Percentage of Passenger Car Production  
by Years and Price Classes. 1912-1923.<sup>1</sup>

Years Under	\$1000	\$1000	\$2000-	\$3000 and
	\$1000	\$2000	\$3000	over
1912	43.8	47.7	2.9	5.6
1913	62.7	28.5	5.	3.8
1914	62.5	29.5	5.5	2.5
1915	72.3	24.4	2.2	1.1
1916	81.3	15.5	2.4	.8
1917	79.8	17.5	1.5	1.2
1918	71.6	24.2	3.4	.8
1919	58.9	34.9	4.2	2.
1920	59.4	32.9	4.3	3.4
1921	69.	23.3	5.4	2.3
1922	74.	21.8	2.5	1.7
1923	81.6	16.4	1.2	.8

1. Automotive Industries, Feb. 21, 1924, p. 372.

The motor truck has attained its place of importance in our transportation system largely during this period. According to the data presented in Table 5, there were only 3,255 motor trucks produced in 1909 and only 10,374 produced prior to 1911, while the production in 1923 is placed at 392,760. Thus, production of motor trucks in the last year of this period was 120.7 times greater than in 1909.

TABLE 5

Annual Production of Motor Trucks.  
1909-1923.<sup>1</sup>

Year	Number	Year	Number
1909	3,255	1917	128,157
1903-10	10,374	1918	227,250
1911	10,655	1919	316,364
1912	22,000	1920	322,039*
1913	23,500	1921	147,550*
1914	25,375	1922	252,668*
1915	74,000	1923	392,760*
1916	90,000	1924	374,317*

\* Includes Canadian Production.

The mechanical and aesthetic improvement of the product is so obvious that mere reference to this development will suffice. A comparison of 1909 models with those of 1923 would reveal the tendency in a more striking way than it could possibly be described. It is, of course, only natural that improvements should be made, since a decided ad-

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1. Facts & Figures of the Automobile Industry, 1924,  
p. 7.

vantage accrues to the producer who can develop a more efficient, durable and beautiful product.

#### The Third Period (1924--)

The automobile industry is just now entering its third stage of development, that of stability or maturity. Norman G. Shidle, editor of *Automotive Industries*, summarizes the present situation as follows: "(1) Production capacity exceeds demand; (2) sales costs are rising as is sales resistance; (3) the industry nearly has reached its period of stabilization where increases in yearly output are likely to come chiefly as a result of increased population and increasing foreign trade; (4) further increase in production capacity at this time will not benefit the industry; (5) because the bonanza period has passed, profits are likely to be more steady and operations more stable in the next five years; but sales are going to be harder to make."<sup>1</sup>

It is certain that the inefficient producer is finding it increasingly difficult to hold his position in the industry. As production capacity approached

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1. Automotive Industries, Feb. 12, 1925.

and eventually passed the effective demand for motor vehicles, the market gradually shifted in favor of the purchaser, competition became keener, and more scientific methods became necessary if profits were to be realized. This tightening of competitive forces resulted in the elimination of many of the less efficient concerns both by failure and by merging with larger and more successful establishments.

It would seem that the period of exploitation has reached or is fast approaching an end, that future production schedules must be worked out largely on the basis of replacements, and that producers must prepare to meet problems which are peculiar to the stabilized and mature industry.

## CHAPTER II.

## THE EXTENT OF CONCENTRATION

Definition of Terms.

It will be necessary, due to the loose and indiscriminate use of the several terms denoting combination, to define certain ones which will appear hereafter in this study. Combination, merger, amalgamation, consolidation, concentration, etc., are terms which popularly convey very nearly the same meaning and yet stand for distinctly different things.

Combination is vague and inclusive in its meaning and may be applied to anything from the very loosest association or agreement to the closest union. It includes all of the above mentioned terms and is often used to denote even looser forms of association which are not given consideration in this study. Consequently, slight use will be made of the term.

Consolidation denotes a rather close, compact union or fusion of previously separate units. Either partial or total loss of autonomous existence is implied. It will be used with reference to combinations effected by merger, amalgamation or the holding company route. Merger and amalgamation are often referred to as complete consolidation while the securities-holding type is designated as partial

consolidation. However, this distinction is unnecessary for our purposes.

A merger is a form of consolidation in which one company or business organization absorbs one or more others without losing its identity. For example, company A absorbs companies B and C and the consolidation resulting is a larger company A, the other two having ceased to exist as separate units.

An amalgamation is a form of consolidation in which the combining units all lose their identity, forming a single new organization. For example, companies A, B, and C consolidate and form company D.

The holding company or partial consolidation form is effected by the acquisition of all or a majority of the stock of a corporation by another concern. The policies of a group of corporations may be coordinated by this means and control centralized in the security-holding concern.

Examples of all three types of consolidation are plentiful in the automobile industry. The merger and holding company forms are most in evidence while pure amalgamations are less numerous. Amalgamation was more common in the earlier years of the industry's development when the concerns were more nearly the same size. At that stage two or more small concerns

often amalgamated and formed a new company. At the present stage, due to the reduction in the number of establishments and the evolution of a comparatively few large concerns, amalgamation is rather uncommon.

The term concentration is used to indicate any increase in the average size of manufacturing establishments. It is effected in two ways: (1) by consolidation; and (2) by expansion of the unit itself. Illustrations of these may be drawn from the two greatest manufacturing establishments of the industry. The General Motors Corporation is an instance of marked concentration effected largely by means of consolidation. The Ford Motor Company is an instance of equally marked concentration effected mainly by means of the expansion of the unit itself.<sup>1</sup> Both of these concerns will be dealt with in detail in a later chapter.

The second way in which concentration may be effected, the expansion of the unit itself, requires further consideration. It is evident that there are

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1. It is not meant to imply that either of the above mentioned concerns is a pure example of the point in question. Each one has evolved as a result of both consolidation and the expansion of the unit itself. However, one is representative of the former, the other representative of the latter.

only two conditions under which an establishment can profitably expand: (1) it may grow as the industry itself grows, assuming that the number of establishments in the field does not increase; and (2) it may expand as a result of the strangling of competitors even though the industry itself is static. This means that the task of supplying a given demand falls upon fewer concerns, and hence the production of the average establishment must increase. The list of strangled concerns in the automobile industry would fill several pages. A few examples of note are:

(1) the Detroit Motor Car Company of Detroit, Michigan, the assets of which were liquidated in July, 1919;<sup>1</sup> (2) the Allen Motor Company of Columbus, Ohio, which passed into receivership in May, 1920 and liquidation of which began in September, 1921;<sup>2</sup> (3) the Lincoln Motor Company of Detroit, Michigan, the assets of which were liquidated in February, 1922;<sup>3</sup> (4) Stevens-Duryea, Inc. of Springfield, Mass., the assets of which were sold at receiver's sale in

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1. Automotive Industries, July 31, 1919, p. 245  
 2. Automotive Industries, May 27, 1920, p. 1236  
 3. Automotive Industries, Feb. 9, 1922, p. 304



October, 1923;<sup>1</sup> (5) the Winton Motor Company of Cleveland, Ohio which suspended the manufacture of automobiles in February, 1924;<sup>2</sup> (6) the Dort Motor Car Company of Detroit, Michigan, the liquidation of which began in November, 1924;<sup>3</sup> and (7) the Dorris Motor Company of St. Louis, Missouri, the liquidation of which began in April, 1925.<sup>4</sup>

This study is directly concerned with the interpretation of facts which lie within the scope of the term concentration, as above defined. It is concerned with consolidation only so far as it is a factor contributing to the broader result.

It is well to note here that had there been no concentration movement in the automobile industry the natural growth would have been possible only by an increase of the number of manufacturing units. Thus, in 1899 there were 57 establishments which produced 3700 cars, an average production per establishment of 65 cars. On this basis, assuming no concentration movement, it would have required approximately 62, 877 concerns to produce the 1923 output. Consultation of Table 1, page 6, shows, however, that there actually were only 351 establishments producing

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1. Automotive Industries, Oct. 11, 1923, p. 758.
  2. Moody's Industrials, p. 1821.
  3. Automotive Industries, Nov. 13, 1924, p. 863.
  4. Automotive Industries, May 7, 1925, p. 840.

cars in that year.

The Concentration Tendency.

Four rather accurate methods of measurement may be applied to the automobile industry in an attempt to determine the concentration tendency: (1) the number of motor vehicles produced by the average establishment; (2) the value of the product of the average establishment, adjustment being made for changes in the price level; (3) the capital invested in the average establishment, adjustment being made for price changes; and (4) the number of wage earners employed in the average establishment. The first, third, and fourth of these indices are limited in accuracy by certain elements which lead to error and these elements will be discussed as each measure is treated separately. The second is absolute in its accuracy if it may be assumed that the Census reports are wholly accurate and that the wholesale price index of the Bureau of Labor Statistics is exact in representing price changes. This assumption is made throughout this thesis since these represent the raw materials upon which all such analysis must be based. Such slight error as may enter from these sources must be disregarded for correction is impossible.

Each measure indicates that the tendency has been effective to a different degree but all agree on the direction of the general tendency and lead to the same general conclusion.

In Table 6 is shown the aggregate production, the number of manufacturing establishments, the number of motor vehicles produced by the average establishment and also an index of the production of the average establishment.

TABLE 6

Number of Motor Vehicles Produced  
By the Average Establishment.  
(In Census Years 1899-1923)

Year	No. of Motor Vehicles Produced	No. of Estab's *	No. of Motor Vehicles Produced by Ave. Estab.	Index of Production of Ave. Estab.
1899	3,700	57	65	100
1904	21,975	121	182	280
1909	130,986	265	494	760
1914	569,054	300	1,897	2,918
1919	1,974,016	315	6,267	9,626
1921	1,661,550	385	4,575	7,038
1923	4,086,997	351@	11,644	17,914

' Figures by the National Automobile Chamber of Commerce.

\* Biennial Census of Manufactures, 1921, p. 1035.

@ Preliminary Release, 1923.

The number of motor vehicles produced by the average establishment in any given year is calculated by dividing the total production of that year by the number of producing establishments. The index of the production of the average establishment is

calculated by dividing the data in the fourth column by 65, the production of the average establishment in 1899.

This data reveals some interesting facts. First, the number of motor vehicles produced by the average establishment has increased in each succeeding census year with the exception of 1921, the average concern producing 179.14 times as many units in 1923 as in 1899. Second, the number of producing establishments increased very gradually until a maximum of 385 was reached in 1921. Third, in 1923 the number of establishments actually declined to 351 even though production was approximately two and one-half times greater than in 1921.

The decrease in production of the average concern in 1921 can be almost wholly explained by the stage of the business cycle in which the industry then found itself. It suffered severely along with almost every other type of industrial from the rapidly falling price level and the general business stagnation which prevailed at that time. Factory capacity had been expanded and many new concerns had entered the field to reap the large profits which seemed certain during the upward swing of the price level. In 1921, while prices were fast declining and

the subsequent necessity of writing down inventory valuations arose, many concerns in the industry failed and, with few exceptions, those which did weather the storm operated on only a part time basis and suffered a deficit at the end of the year. A conspicuous example of this is the General Motors Corporation which suffered a deficit in 1921 of over \$65,000,000. It followed from these conditions that production schedules were cut almost in half. Thus, it will be seen that the decrease in the number of units produced by the average concern in 1921 does not necessarily represent decentralization but indicates in the main the effect of an abnormal condition.

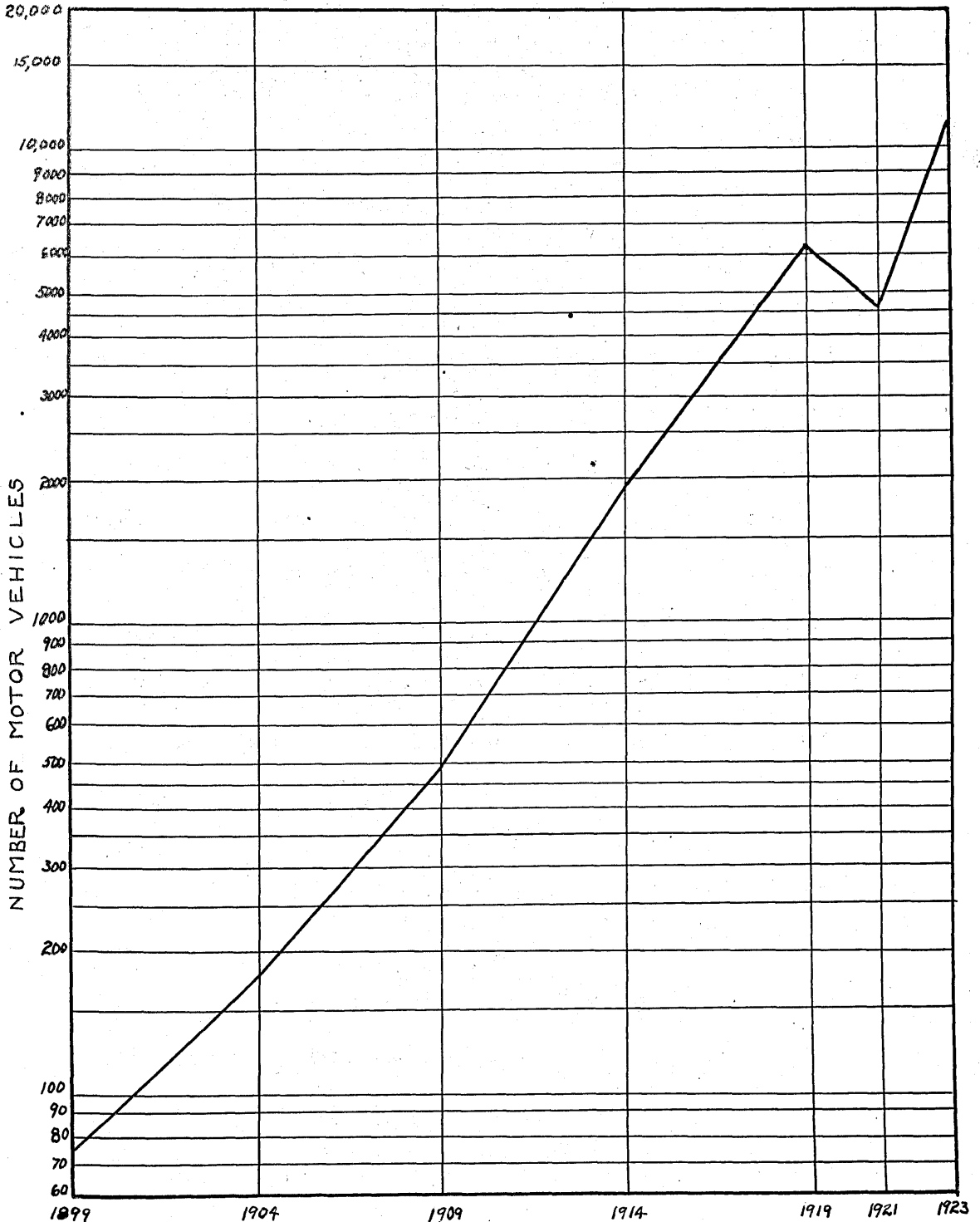
Likewise the increase in the number of establishments from 315 in 1919 to 385 in 1921 may be partially accounted for by the rising price level which tended to attract new concerns into the industry until April or May, 1920. Many of these economically unjustified establishments had been forced out of operation by the end of 1923 and this fact partially accounts for the decline to 351 establishments in 1923.

Chart 2 sets forth graphically the data presented in Table 6. It should be observed that it is graphed on a logarithmic scale so that the rate of progression or regression of the tendency during the period is recorded.

## CHART 2

The Tendency Toward Concentration as Measured  
By the Number of Motor Vehicles Produced  
By the Average Establishment.  
1899-1923

(Based on Data in Table 6)



The general conclusion to be drawn is that, according to the first measure, the tendency toward concentration has been very marked since 1899. Further, examination of Chart 2 shows that it was most active during the last period, 1921-1923. It must not be over-looked here, however, that this measure overstates the actual tendency to a very considerable degree due to the change during the period in the value of the average automobile. By calculation it is found that the value of the average automobile in 1923 is only 31.2 per cent as much as in 1899. Hence this measure would overstate the tendency 68.8 per cent.

It is to be regretted that comparable statistics are not available for years in which the Census did not make compilations. However, the data for the intervening years would, with minor fluctuations, be in accord with the general tendency and would in no way alter the general conclusion. Statistics collected on a slightly different basis and by another authority will be presented now in an attempt to indicate more completely the recent tendency.

In Table 7 is shown for the period 1920-1924 the number of passenger cars produced, the number of establishments engaged in their manufacture, the number produced by the average establishment, and

TABLE 7.

Number of Passenger Cars Produced  
By the Average Establishment.  
1920-1924

Year	Number of Passenger Cars Produced.*	Number of Establish- ments. *	No. produced by Average Establish- ment.	Index of Pro- duction of Ave. Estab- lishment.
1920	1,883,158	129	14,598	100
1921	1,514,000	177	8,554	58.6
1922	2,406,396	112	21,486	147
1923	3,694,237	90	41,047	281
1924	3,243,285	73	44,429	304

\* Figures by Nat'l Automobile Chamber of Commerce also an index of the production of the average establishment. The number of concerns engaged in the manufacture of cars and trucks in each of these years is not available; hence the data with reference to passenger cars only is presented. Since they form a far greater share of the total product than do trucks and since the conditions of manufacture are very similar, it is believed that this data may be depended upon to picture quite accurately the recent tendency. Chart 3 represents in graphic form the data set forth in Table 7.

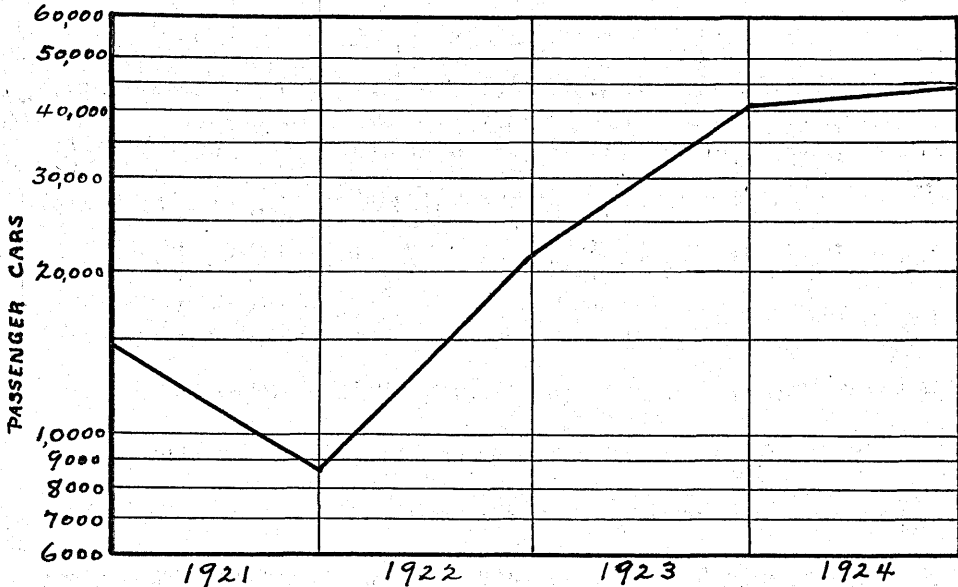
The decrease in the production of the average establishment in 1921 has already been discussed. A gradual decline in the number of establishments, a gradual increase in the number of cars produced by the average concern and the slowing down of the concentration tendency are apparent. Again, it



## CHART 3

The Tendency Toward Concentration as Measured  
By the Number of Passenger Cars Produced  
By the Average Concern. 1920-1924.

(Based on Data of Table 7)



must not be overlooked that this measure tends to overstate the tendency. By calculation it is found that the value of the average automobile in 1924 was 97.5 per cent that of 1920 and hence the general tendency would tend to be overstated 2.5 per cent.

While Tables 6 and 7 show quite adequately the production of the average establishment during the period, it is impossible to ascertain from this data the distribution of the production among the establishments of the industry, that is, whether the bulk of motor vehicles produced are manufactured by a comparatively few large concerns or whether production is rather evenly distributed among the pro-

ducing establishments. In this connection the data set forth in Table 8 and illustrated in Chart 4 is interesting. It shows the production of the ten largest producers of motor vehicles as measured by the number of units produced for the years 1922, 1923, and 1924; also the percentage which the output of each concern bears to the total production and the percentage which the total product of the leading ten bears to total production.

It is manifest that the bulk of production is carried on by a few large establishments or, in other words, that production distribution is very unequal among the manufacturing concerns. The following facts should be noted especially. (1) The ten leading concerns turned out 91.3 per cent of the total number of motor vehicles produced in 1922, 93.99 per cent in 1923, and 96.37 per cent in 1924, while all other manufacturing concerns in the industry produced only 8.7 per cent of the total in 1922, 6.01 per cent in 1923, and 3.63 per cent in 1924. (2) One concern produced 50.82 per cent of the total number in 1922, 51.13 per cent in 1923, and 55.1 per cent in 1924. (3) Two concerns produced 68 per cent of the total number in 1922, 70.66 per cent in 1923, and 71.33 per cent in 1924. (4) Five

TABLE 8.

Comparison of Production of the Ten Leading  
Concerns With Total Production.  
1922-1924.\*

Concerns and Totals	1922	% of total	1923	% of total	1924	% of total
Ford Motor Company	1,351,333	50.82	2,089,777	51.13	1,993,419	55.10
General Motors Corp.	456,763	17.18	798,555	19.53	587,341	16.23
Durant Motors Inc.	59,000 <sup>1</sup>	2.22	178,000 <sup>2</sup>	4.35	111,543 <sup>3</sup>	3.08
Willys-Overland Co.	96,000	3.61	196,038	4.79	162,998	4.50
Dodge Brothers	165,000	6.21	179,505	4.39	222,236	6.14
The Studebaker Corp.	110,267	4.15	145,167	3.55	110,240	2.95
Hudson Motor Car Co.	61,233	2.30	88,184	2.15	128,664	3.56
Maxwell Motor Corp.	53,373	2.01	67,100	1.64	82,000 <sup>4</sup>	2.27
Nash Motors Company	40,458	1.52	56,569	1.38	53,135	1.47
Paige-Detroit Motor Car Co.			42,862	1.04	34,538	.95
Hupp Motor Car Corp.	34,167	1.28				
Total of Ten Leading	2,427,594	91.30	3,841,757	93.99	3,486,104	96.37
All Others -- Total	231,470	8.70	245,240	6.01	131,498	3.63
Total of United States	2,659,064		4,086,997		3,617,602	

\*Data taken from Moody's Industrials

1. Automotive Industries, Jan. 17, 1924, p.157.

2. Ibid

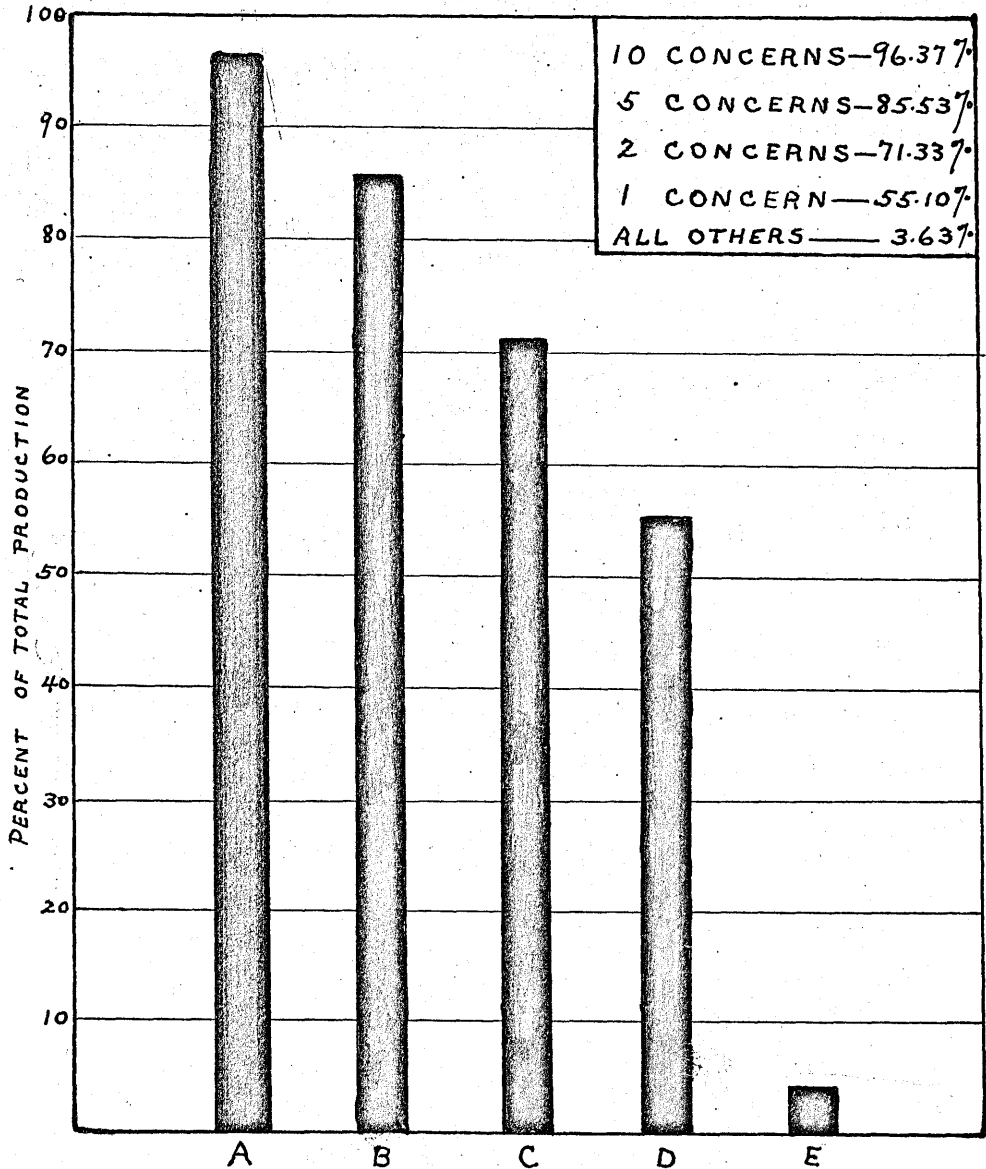
3. Annual Report, Durant Motors, Inc., May 29, 1925.

4. 69,000 for ten months -- 2 months estimated at 13,000.

31.  
CHART 4

Distribution of Motor Vehicle Production  
1924

(Based on Data in Table 8)



A--10 Leading Concerns.

B--5 Leading Concerns.

C--2 Leading Concerns.

D--Largest Producer.

E--All Others Besides Leading 10.

concerns produced 81.97 per cent of the total in 1922, 84.19 per cent in 1923, and 85.53 per cent in 1924.

These figures indicate an unswerving and unfaltering tendency for the past three years and bear out the following analysis of the situation by Charles W. Nash in January, 1925:

"Like all other great industries this automobile business is simmering down to a small group of manufacturers best qualified by ability and financial stability to carry on the task of giving the public the very utmost for each dollar spent."<sup>1</sup>

TABLE 9  
Value of the Product of the Average  
Establishment Before and After  
Adjustment for Price Changes

(In Census Years 1899-1923)

Year	Total Wholesale Value of Product*	No. of Establishments*	Value of Product of Ave. Establishment.	Index 1913-100	Adjusted Value of Product of Ave. Estab.
1899	4,748,011	57	83,298	79.4	104,910
1904	26,645,064	121	220,207	85.6	257,251
1909	193,823,108	265	731,408	96.9	754,807
1914	503,230,137	300	1,677,434	98.1	1,709,922
1919	2,387,903,287	315	7,580,645	206.4	3,672,793
1921	1,671,386,976	385	4,341,265	146.9	2,955,252
1923	3,163,327,874 <sup>©</sup>	351	9,012,330	153.7	5,863,585

\* Biennial Census of Manufactures, 1921, p. 1035.

" Wholesale Price Index of the Bureau of Labor Statistics. Monthly Labor Review, Feb., 1925, p. 53.

© Preliminary release of the Biennial Census of Manufactures, 1923.

1. Speech to Dealers in Milwaukee, Wisconsin.  
Automotive Industries, Jan. 19, 1925, p. 204.

The second measure of the concentration tendency is the value of the product of the average establishment, adjustment being made for changes in the price level. In Table 9 is shown the total wholesale value of product, the number of establishments, and the value of the product of the average establishment before and after adjustment for price changes. Due to the wide fluctuation of the price level during the period, this adjustment must be made before any degree of accuracy may be attached to this measure. The wholesale price index used is that of the Bureau of Labor Statistics, the base year of which is 1913. The adjusted value is calculated for any given year by dividing the unadjusted figure by the wholesale price index number of that year.

Chart 5 shows the tendency graphed on a logarithmic scale.

It is noteworthy that the adjusted value of product of the average concern has increased in each succeeding census year with the exception of 1921. Consultation of Chart 5 also shows that the tendency as indicated by this measure is the most pronounced in the period, 1921-1923.

As stated earlier in this chapter, absolute accuracy is claimed for this second measure.

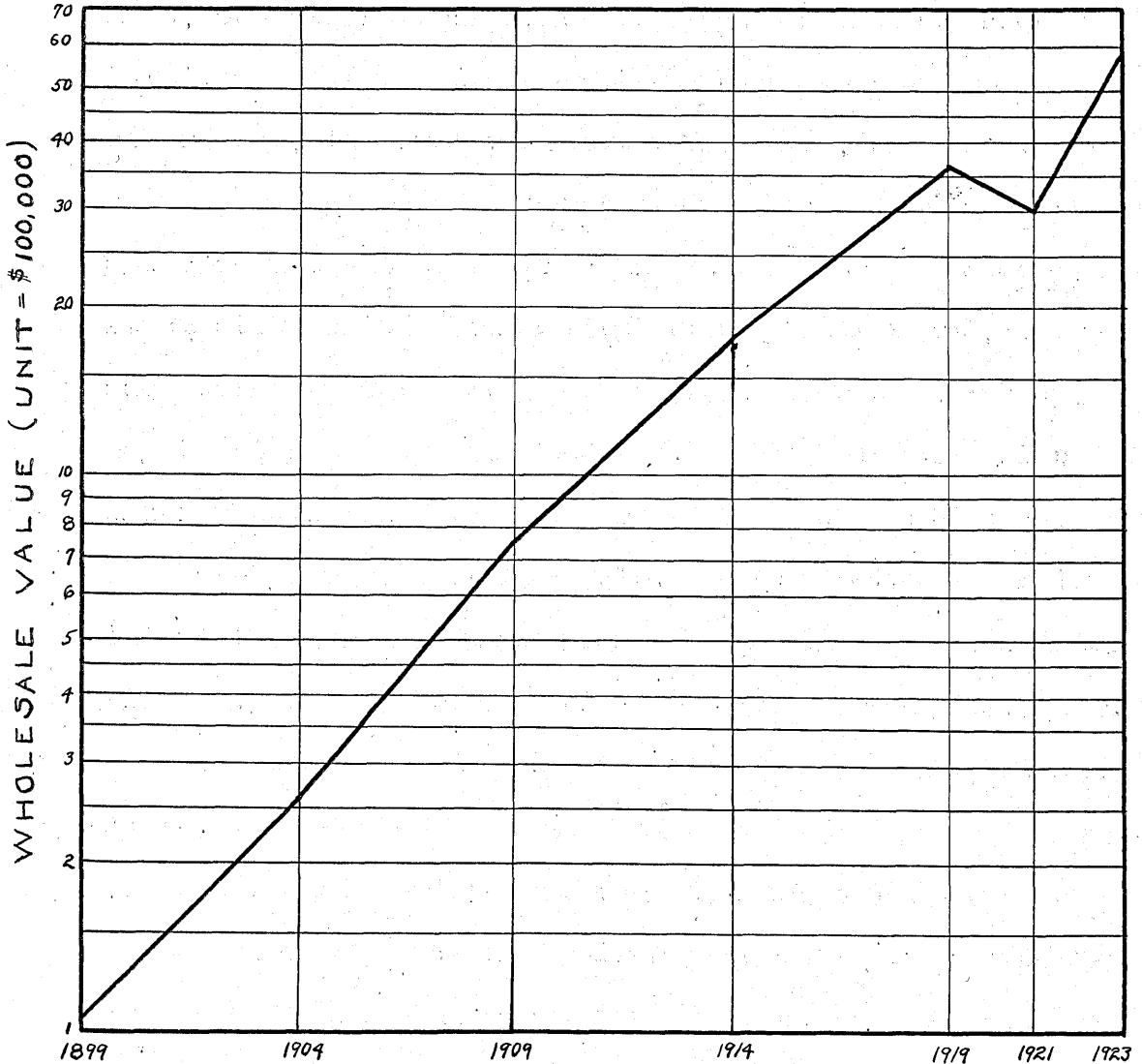
34.

CHART 5

The Tendency Toward Concentration as Measured by  
The Wholesale Value of Product of the  
Average Establishment 1899-1923.

(Adjusted for Price Changes)

(Based on Data in Table 9)



An attempt is made in Table 10 and Chart 6 to show again the more recent concentration tendency as indicated by the value of the product (adjusted for price changes) of the average concern manufacturing passenger cars, 1920-1924. The adjusted value of product of the average establishment is calculated in precisely the same manner as in Table 9, which process has already been described. A comparison of Charts 3 and 6 reveals the fact that the recent tendency as indicated by the first measure is very nearly the same as that indicated by the second.

TABLE 10

Wholesale Value of Product Before and After Adjustment for Price Changes of Average Establishment Manufacturing Passenger Cars. (1920-1924)

Year	Total Wholesale Value of Passenger Cars *	No. of Establishments *	Value of Product of Ave. Establishment.	Index Numbers" 1913-100	Adjusted Value of Product of Ave. Estab.
1920	1,809,170,963	129	\$14,024,581	226.2	\$6,200,080
1921	1,093,918,000	177	6,180,322	146.9	4,207,167
1922	1,567,003,041	112	13,991,099	148.8	8,509,763
1923	2,276,399,270	90	25,293,325	153.7	16,456,295
1924	2,011,038,288	73	27,548,470	149.7	18,402,452

\* Figures by the National Automobile Chamber of Commerce.

" Wholesale Price Index of the Bureau of Labor Statistics. Monthly Labor Review. Feb. 1925, p. 53.

The third measure of the concentration tendency is the capital invested in the average establishment, adjustment being made for price changes.



36  
Chart 6

The Tendency Toward Concentration as Measured by  
Wholesale Value of Product of Average Estab-  
lishment Manufacturing Passenger Cars.

1920-1924

(Based on Data of Table 10)  
(Adjusted for Price Changes)

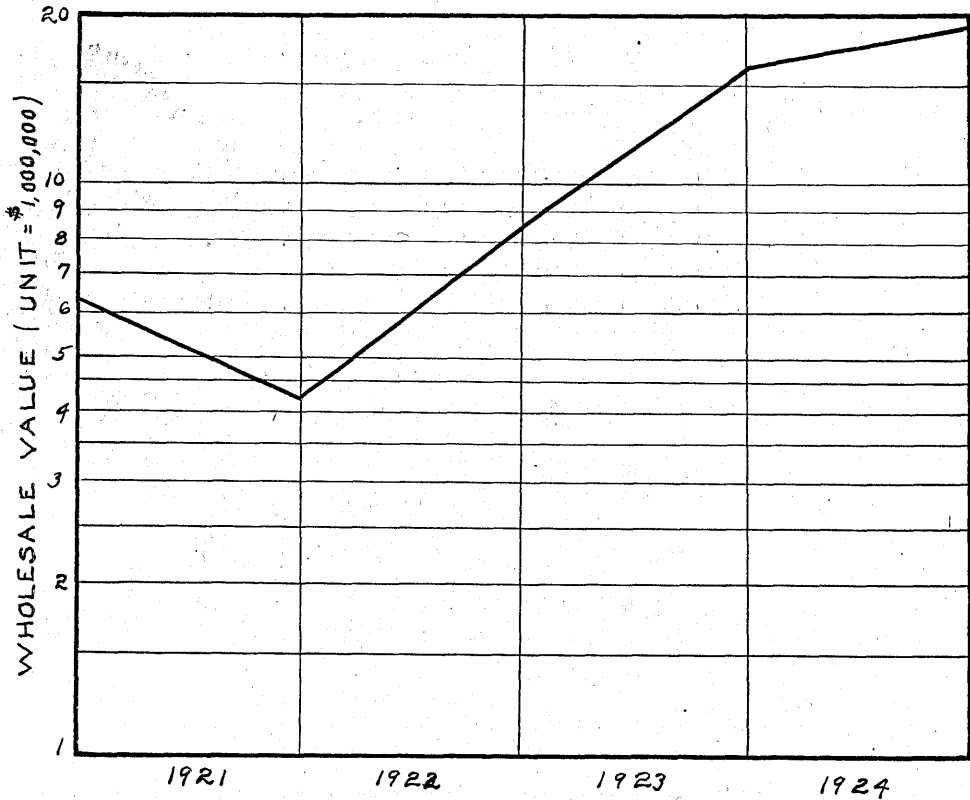


TABLE 11

The Capital Invested in the Average  
Establishment Before and After  
Adjustment for Price Changes  
In Census Years 1899-1919.

Year	Total Capital Invested in the Industry *	No. of Capital Estab- lish- ments*	Capital Invested in Aver. Estab.	Index Numbers" 1913-100	Cap. Invest- ed in Aver. Estab. Adjusted
1899	\$ 5,768,857	57	\$1101,208	79.4	\$ 127,466
1904	20,555,247	121	169,878	85.6	198,456
1909	134,592,965	265	507,898	96.9	524,147
1914	312,875,884	300	1,042,920	98.1	1,063,119
1919	1,310,451,400	315	4,160,163	206.4	2,015,583

\* Biennial Census of Manufactures, 1921, p. 1035.

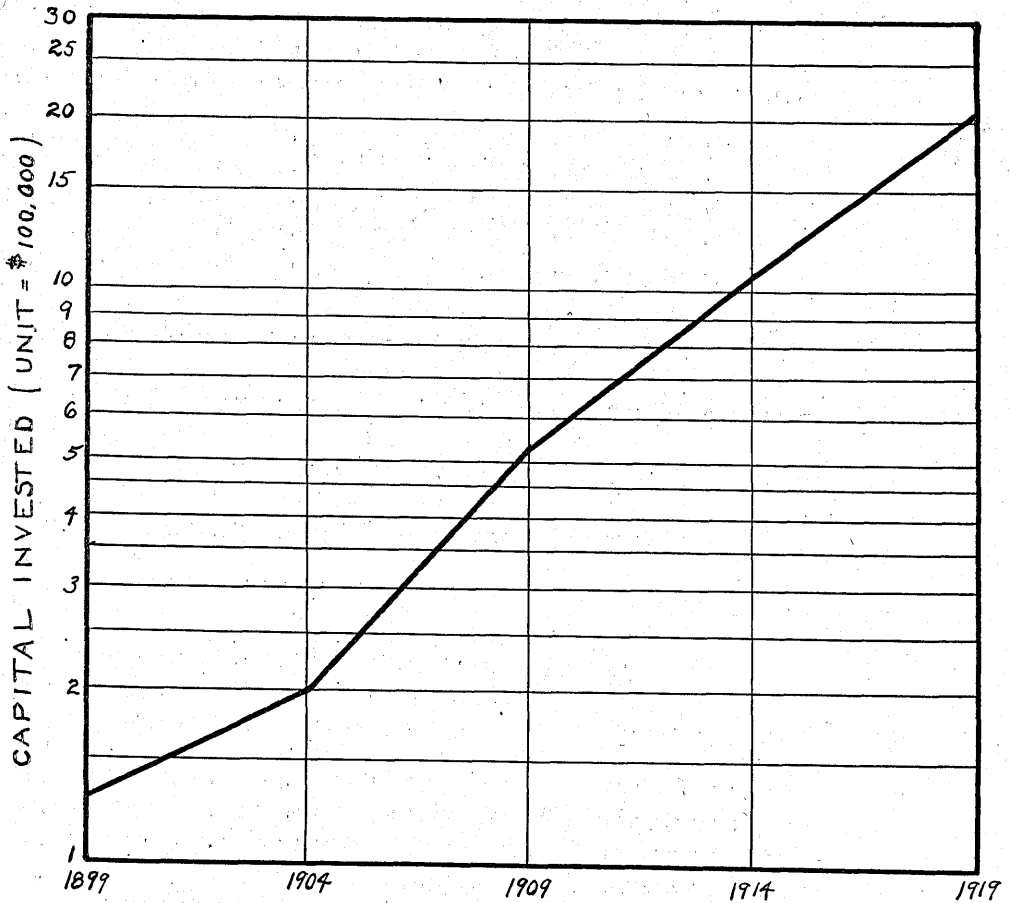
" Wholesale price index of the Bureau of Labor  
Statistics. Monthly Labor Review, Feb., 1925,  
p. 53.

In Table 11 is shown the total capital invested in the industry, the number of establishments and the capital invested in the average establishment before and after adjustment for changes in the price level. The process used in making this correction has previously been explained in connection with Table 10, page 35. It is unfortunate that comparable data is not available for more recent years. No data has been collected in the Census of Manufactures on capital investment since 1919. A graph of the tendency as indicated by the third measure is plotted on a logarithmic scale in Chart 7. It is worthy of notice that the capital invested in the

## CHART 7

The Tendency Toward Concentration as Measured by  
the Capital Invested in the Average  
Establishment 1899-1919

(Based on Data of Table 11.)  
(Adjusted for Price Changes)



average establishment (after adjustment for price changes) increased in each succeeding census year - from \$127,466 in 1899 to \$2,015,583 in 1919.

Three factors which limit the accuracy of the third measure may be pointed out: (1) the introduction during the period of more efficient and scientific methods of management; (2) the fact that the fixed investment in plant, equipment, etc., which constitutes about 50 per cent of the total investment in the automobile industry, is usually carried on the books at the original cost rather than at its appreciated value; and (3) the fact that machinery has, to a marked extent, been substituted for labor.

The influence of the first of these factors on the measure is to minimize the tendency toward concentration since more scientific and efficient management could produce the same amount with less capital invested.

The effect of the second factor is also to minimize the tendency. Investments in buildings, equipment, etc., prior to 1919 which were made during the rising price level, have very seldom been carried on the books at the appreciated value. Hence the wholesale price index tends to overcorrect capital investment.

The substitution of machinery for man power has necessitated a larger field investment in proportion as this substitution has been made. Thus the third factor tends to overstate the tendency and to compensate for the error traceable to the first two. However, consultation of Chart 9 reveals the fact that it only partially adjusts the error. In other words, the third measure tends to understate the concentration tendency due to the preponderant influence of the first two limiting factors mentioned.

The last measure of the concentration tendency to be considered is the number of wage earners employed in the average establishment. In Table 12 is shown the average number of wage earners employed in the industry, the number of manufacturing establishments and the number employed in the average concern in census years 1899-1923. The tendency as indicated by this measure is plotted on a logarithmic scale in Chart 8. References have already been made to the abnormal conditions which were responsible for the decline in 1921. Employees were laid off in that year because factories were running on a part time basis.

TABLE 12

The Number of Wage Earners Employed  
in the Average Establishment

(In Census Years 1899-1923)

Year	Average No. Wage Earners Employed. 1	Number of Establish- ments. 1	No. Employed in Average Establishment
1899	2,241	57	39
1904	10,239	121	85
1909	51,294	265	194
1914	79,307	300	264
1919	210,559	315	668
1921	143,658	385	373
1923 <sup>2</sup>	241,356	351	688

1. Biennial Census of Manufactures, 1921, p. 1035.
2. Preliminary release of 1923 Census of Manufactures.

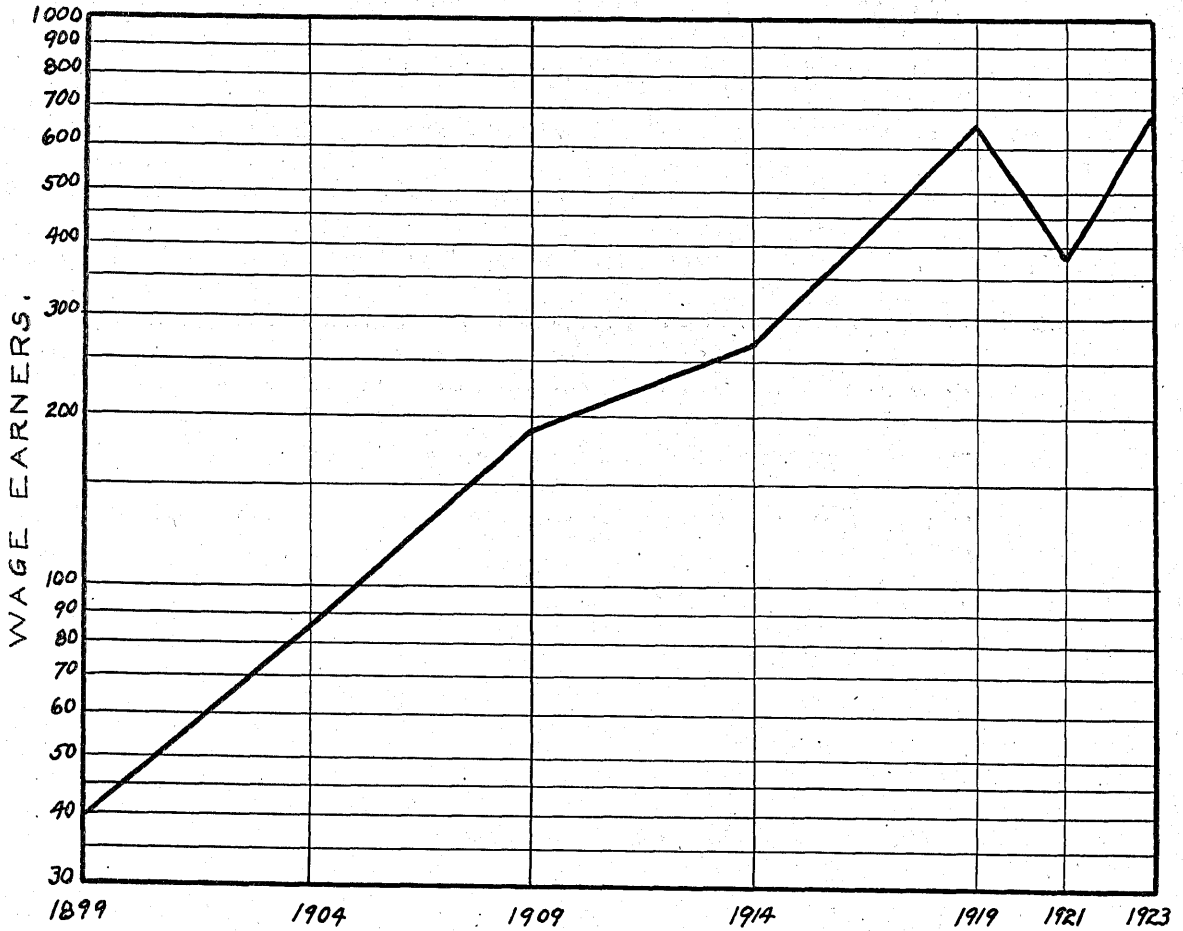
While this last index is a rather accurate measure of the growth of the size of the average establishment, it is also subject to limitations. Two such factors may be pointed out: (1) machine methods have displaced hand labor to a very great extent; and (2) the working day has gradually grown shorter during the period.

It is manifest that the first of these would tend to minimize the concentration tendency as indicated by this measure to a very considerable extent. A rough idea of the error arising from this source is revealed by these figures taken from Table 1. In 1899, 2,241

42.  
CHART 8

The Tendency Toward Concentration as Measured by  
The Number of Wage Earners Employed in  
the Average Establishment.  
In Census years 1899-1923

(Based on Data in Table 12)



wage earners produced 3700 automobiles or 1.65 cars per man employed: in 1923, 241,356 wage earners produced 4,087,997 automobiles or 16.9 cars per man employed.

This enormous increase in the number of motor vehicles produced per man employed is, of course, due both to more efficient management and the displacement of labor by machinery but it can be traced largely to the latter.

The influence of the second factor is an open question. If it is assumed that the efficiency of labor is the same under the condition of a long working day as of a short working day, its influence would be to overstate the tendency since more employees would be needed in order to produce the same amount. On the other hand, if it is assumed that the gain in the efficiency of the worker when laboring fewer hours is more than sufficient to compensate for the difference in the length of the working day, the effect would be the opposite, i. e., to minimize the tendency. Fewer laborers would be needed to produce the same amount. Chart 9 shows that the net influence of these limiting factors is to understate the tendency considerably.

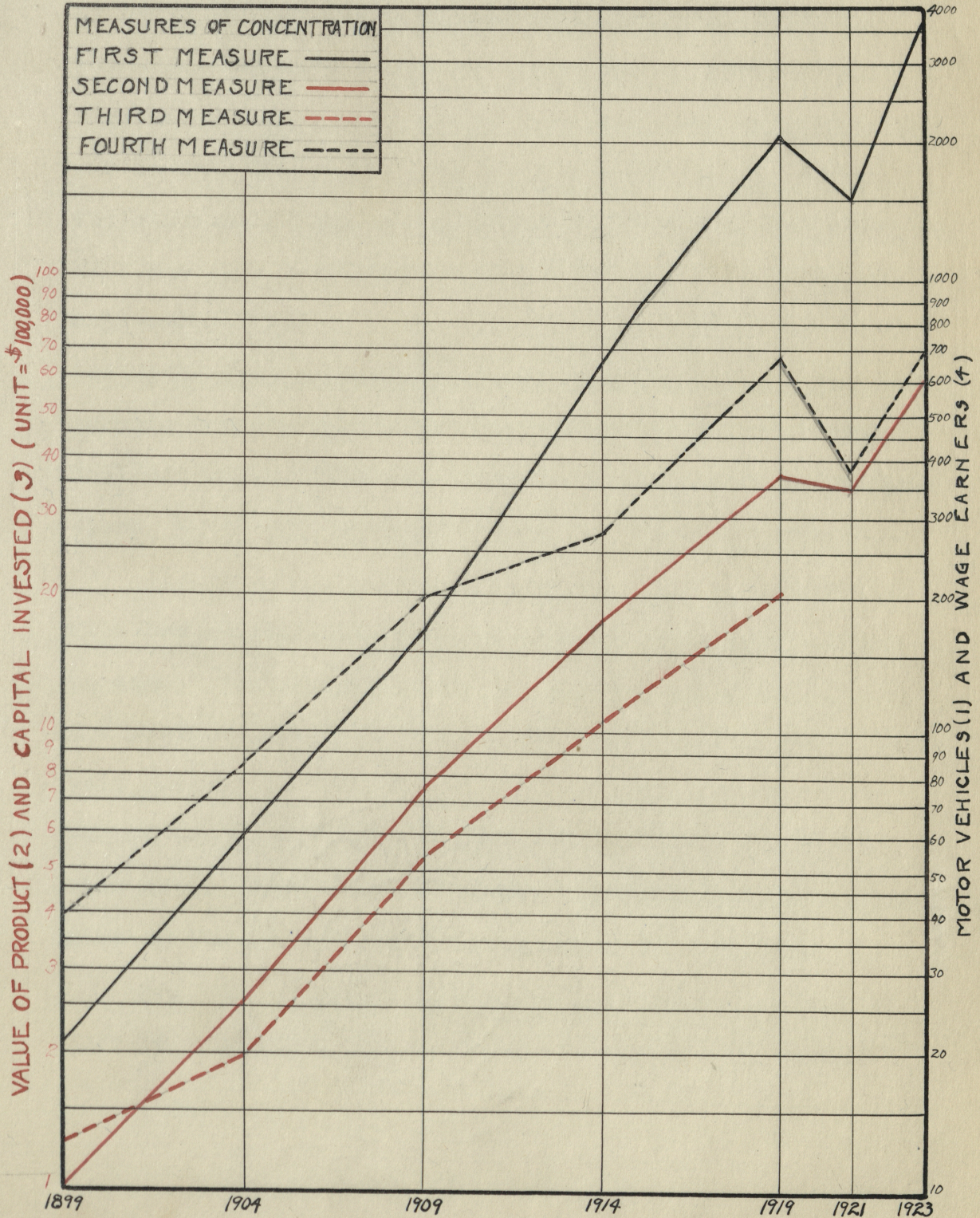
In Chart 9 the concentration tendency as indicated



## CHART 9

The Tendency Toward Concentration as Measured  
By Each of the Four Indices  
Census Years 1899-1923

(Based on Data In Tables 6,9,11, & 12.)



by each of the measures applied is plotted on a logarithmic scale. The data of the first measure is divided by three so that it may be more easily compared to the other measures plotted. In so far as corresponding segments of the lines are not parallel, the influence of the limitations which have been pointed out has marred the accuracy of the quantitative statement of the tendency.

The question arises here of how far this tendency will eventually go. Will the production of motor vehicles ultimately be carried on by a half-dozen or less concerns? Are the small concerns doomed to failure? General statements only are possible in answer to these questions, however, two facts seem to stand out prominently.

(1) It seems practically certain that concentration will become gradually more pronounced for several years to come. The large concern has a distinct advantage in the production of a standardized product which lends itself readily to mass production. A continuation of the recent rapid development along the lines of standardization seems inevitable and hence a gradual increase in the size of the average establishment may be expected.

(2) It also seems very probable that there will always be a place in the automobile industry for a limited



number of small manufacturers. The extent to which standardization of product may be carried is limited because a certain proportion of the buying public will never be content with a car which is just like that owned by every one else. There will always be a demand for the product which is different and distinctive, which has a peculiar style appeal, individual touches and unusual construction. It will be the province of the small manufacturer to supply a part of this demand for a product which does not lend itself readily to standardization.

## CHAPTER III

## SPECIFIC INSTANCES OF CONCENTRATION

The predominance of a comparatively few large concerns has been indicated and discussed in Chapter II, and it has been pointed out further, that concentration is brought about in two ways: (1) by consolidation; and (2) by expansion of the unit itself. This chapter deals with the financial history of three outstanding examples of concentration: (1) the General Motors Corporation; (2) Durant Motors, Inc.; and (3) the Ford Motor Company. The first two of these concerns may be cited as representative instances of concentration effected in the main by consolidation, while the Ford Motor Company is an instance of concentration brought about largely by the expansion of the unit itself.

In addition, a short discussion of the types of consolidation is appended.

The General Motors Corporation

The General Motors Corporation was organized originally as the General Motors Company. It was incorporated in New Jersey, September 16, 1908, "to man-

ufacture and deal in motors, motor cars and machines; to acquire from others their business if of the same general character as that for which this corporation is organized; to acquire patents and trademarks; to acquire and dispose of by sale, mortgage or otherwise securities of other corporations." <sup>1</sup> The original authorized capital stock was \$2,000 consisting of ten shares of common stock with par value of \$100 and ten shares of preferred stock with par value of \$100. However, on September 30, the authorized capital stock was increased to \$12,500,000 consisting of \$7,000,000 preferred and <sup>2</sup> \$5,500,000 common. It was formed as a holding company and did not own the physical assets of any of the subsidiary units. Control was exercised through the medium of stock ownership which in most cases represented ownership of the entire amount of the subsidiary company's issued stock, although in some instances only a majority ownership interest was acquired.

The holding company, which had been promoted by Mr. W. C. Durant of the Buick Motor Company, grouped together several of the pioneer establishments of the industry under one central control. Of these the most im-

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1. Moody's Analyses of Industrials, 1914, p. 706.  
 2. The Commercial and Financial Chronicle, Vol. 88, p.689.

portant were the Buick Automobile Company, the Cadillac Motor Car Company, the Olds Motor Works, and the Oakland Motor Car Company. Control of several concerns of less importance was also acquired at the outset.

The immediate cause of this consolidation can probably be traced to the hard times which prevailed in the industry during the preceding period, 1907-1908. Very few concerns in the industry were operating on a profitable basis in those years while several were on the verge of financial disaster. It is only natural under such conditions for certain readjustments to be made with a view to relieving the situation. In fact, it has always been the case, since the rise of the corporate form of organization to a prominent place in American industry, that the number and extent of consolidations increase, relatively, following a period of general financial stringency and decrease during a period of general prosperity. In the case of the main units which entered this consolidation, only one, the Buick Automobile Company, (sometimes called the mother concern) had been operating on a consistently profitable basis. The Oakland Motor Car Company was on the verge of bankruptcy and the Olds and Cadillac companies were not earning dividends.

A policy of expansion was adopted at the outset and

the organization soon became quite extensive. In September, 1909, the authorized capital stock was increased from \$12,500,000 to \$60,000,000, the commonstock from \$5,500,000 to \$40,000,000 and the preferred stock from \$7,000,000 to \$20,000,000.<sup>1</sup> A statement of the stock held September 30, 1910 in the constituent companies, directly and through subsidiaries follows:<sup>2</sup>

<u>Company</u>	<u>St'k Outstanding</u>	<u>Amt. Held</u>
Buick Motor Co. -----	\$2,500,000	\$2,498,500
Cadillac Motor Car Co.-----	1,500,000	1,500,000
Olds Motor Works-----	3,132,390	3,132,390
Marquette Motor Co.-----	793,000	793,000
Cartercar Co. <sup>4</sup> -----	607,720	552,720
Oakland Motor Car Co.-----	800,000	800,000
Rapid Motor Vehicle Co.-----	500,000	364,650
Northway Motor & Mfg. Co.-----	725,000	725,000
Elmore Mfg. Co.-----	600,000	600,000
Reliance Motor Truck Co.-----	481,200	474,223
Welch Co. of Detroit-----	275,000	275,000
Weston-Mott Co.-----	1,500,000	747,000
Randolph Motor Car Co.-----	399,400	299,400
Welch Motor Car Co.- Pontiac-	224,000	224,000
Jackson-Church-Wilcox Co.-----	240,000	240,000
Mich. Motor Castings Co.-----	100,000	100,000
Champion Ignition Co.-----	100,000	75,000
Mich. Auto Parts Co.-----	300,000	300,000
McLaughlin Mo. Car Co. Ltd.--	1,003,000	500,000
General Motors Co. of Mich.--	10,000	10,000
Oak Park Power Co.-----	200,000	133,000

It is worthy of notice that all of the capital stock of twelve of the subsidiary companies was owned at this time and that a majority ownership interest was held in

1. Commercial and Financial Chronical, Vol. 89; p. 723.

2. Ibid. Vol. 91; p. 948.

3. \$2,000,000 common, \$500,000 preferred; \$1,500 of preferred not held.

4. Common stock \$557,720; preferred \$50,000--none held.

all the rest except two. More than one-half the stock which conveyed voting rights was held in each subsidiary. The purchase of the interest in these units was effected in most cases by an exchange of the common stock of the General Motors Company for that of the unit, the control of which was desired. A cash consideration was also frequently involved.

During the period September 30, 1910 to July 31, 1916 the consolidation program was retarded and very few additions of note were made. The Corporation turned its attention to internal problems of efficiency. Seventy-five per cent of the common and preferred stock of the Heany Company was acquired in 1911, a holding company controlling the Heany Lamp Company, manufacturers of incandescent electric lamps, and the Heany Fireproof Wire Company, manufacturers of asbestos covered magnet wire.<sup>1</sup>

By July 31, 1913, five concerns had been added to the list as of September 30, 1910--the Peninsular Motor Company, the Heany Company, the General Motors Export Company, General Motors Truck Company while two had disappeared, the Marquette Motor Company, and the General Motors Company of Michigan.

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1. Moody's Industrials, 1914, p. 706.



Between July 31, 1913, and July 31, 1914, a rather drastic internal reorganization occurred with a view to securing increased manufacturing efficiency. Two cars, the Elmore and the Marquette, were dropped from the production schedule, and eleven companies were eliminated as separate organizations. After these readjustments the organization consisted of the following companies:<sup>1</sup>

Buick Motor Company, Flint, Michigan.

Cadillac Motor Car Company, Detroit, Michigan.

Cartercar Company, Pontiac, Michigan.

Champion Ignition Company, Flint, Michigan.

Gen. Motors Export Company, New York, N. Y.

Gen. Motors Truck Company, Pontiac, Michigan.

General Motors, Ltd., London, England.

Jackson-Church-Wilcox Company, Saginaw, Michigan.

Oakland Motor Car Company, Pontiac, Michigan.

Olds Motor Works, Lansing, Michigan.

Northway Motor & Mfg. Company, Detroit, Michigan.

McLaughlin Motor Car Co., Ltd., Oshawa, Canada.

Weston-Mott Company, Flint, Michigan.

The only change of importance in the organization of the Company before July 31, 1916, was the discontinuance

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1. Moody's Industrials, 1915, p. 1127.

of the Cartercar line and the consequent elimination of that unit as a separate organization. During this entire period production capacity constantly was expanded in response to the rapidly growing demand.

On October 13, 1916, the General Motors Corporation was incorporated in Delaware "to manufacture, buy, sell and deal in motor vehicles, boats, flying machines, etc., their parts and accessories, and the conduct a general automobile business in all its branches."<sup>1</sup> The authorized capital stock was \$102,600,000 with par value \$100, consisting of \$82,600,000 of common and \$20,000,000 of preferred. The primary purpose of the formation of the new corporation was to acquire in exchange for its own stock all the stock of the General Motors Company of New Jersey, and accordingly, a plan of stock exchange was outlined which the directors believed would "afford the present stockholders a more liquid and satisfactory investment and eventually lead to economies in administration to the benefit of all shareholders." This plan which became effective November 1, 1916, provided for (1) the exchange of one and one-third shares of the preferred stock of the Delaware corporation for one share of the preferred

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1. Moody's Industrials, 1925, p. 1111.

stock of the New Jersey company (\$14,985,200 outstanding, hence calling for \$19,980,267) and (2) the exchange of five shares of common stock of the Delaware corporation for one share of the common stock of the old company (16,511,783 outstanding, hence calling for \$82,558, 915)<sup>1</sup>. Every share of the old concern had been secured by August 1917,<sup>2</sup> and its complete dissolution was effected by October,<sup>3</sup> 1917.

Control of the General Motors Corporation was vested in the Chevrolet Motor Company which had acquired 450,000 shares of General Motors Corporation common stock by December 31, 1916. The Chevrolet stockholders had voted on December 23, 1915, to increase the capital stock to \$80,000,000 and had authorized the directors to issue the shares of Chevrolet stock, in their discretion, for the shares of the General Motors Company in a ratio of not greater than five shares of the former for one share of the common stock of the latter. Pursuant to this policy the Chevrolet company had acquired the controlling interest in the General Motors Corporation and, in addition 106,000 shares of the common stock of the United Motors

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1. The Commercial & Financial Chronicle, Vol. 105, p.1510.
  2. Ibid., Vol. 105, p. 823.
  3. Ibid., Vol. 105, p. 1423.
  4. Moody's Industrials, 1917, p. 1297.

Corporation and 13,650 shares of Scripps-Booth Corporation common.<sup>1</sup>

In May, 1917, the General Motors Corporation acquired the capital stock of the Samson Sieve Grip Tractor Company of Stockton, California. No other significant changes or additions were made before 1918 but in that year a policy of rapid expansion was instituted which continued with slight interruption until the depression of 1920. It will be noted that during this period the General Motors Corporation gradually assumed the characteristics of an operating company, acquiring the plants, properties and other assets of its manufacturing divisions. Since General Motors owned all the capital stock, in almost every instance, of the corporations which were converted into Divisions, this change was little more than a formal internal transaction. The separate corporations were dissolved and consequently the physical assets of these concerns appeared on the balance sheet of General Motors instead of their capital stock. The officers of each previously separate corporation were, with few changes, retained in a corresponding office of the Division. Following this formal change those companies whose physical as-

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1. Moody's Industrials, 1917. p. 1297.

sets were acquired and for whom it was desired to maintain a separate accounting system have been designated as Divisions, while those companies, all or a majority of whose stock was owned, were called subsidiary or affiliated companies.<sup>1</sup>

Three increases in the authorized capital stock occurred during 1918 (1) On March 20, the authorized common stock was increased from \$82,600,000 to \$150,000,000 and the authorized preferred stock was increased from \$20,000,000 to \$50,000,000 making a total of \$200,000,000.<sup>2</sup>

(2) On August 27, the authorized common was increased from \$150,000,000 to \$200,000,000 and the preferred was increased from \$50,000,000 to \$100,000,000 making a total of \$300,000,000

(3) On December 10, the authorized capital stock was increased to \$370,000,000 by authorizing an issue of \$150,000,000 six percent cumulative debenture stock (par \$100) and decreasing the preferred from \$100,000,000 to \$20,000,000.<sup>3</sup>

During the year 1918 the following interests were added to the Corporation. (1) On May 21, all the assets of the Chevrolet Motor Company, except the 450,000 shares of General Motors Corporation common stock which it held, were

1. Annual Report, General Motors Corporation, 1923, p. 23.

2. Commercial & Financial Chronicle, Vol. 106, p. 1130.

3. Ibid, Vol. 107, p. 908.

purchased, paying therefor 282,684 shares of common stock.

(2) In June, a controlling stock interest in the Saginaw Malleable Iron Company of Saginaw, Michigan was acquired.

(3) On July 1, all the common stock (\$1,000,000 par value) of the Janesville Machine Company was bought for \$1,000,000 cash; also, 22,975 shares of Scripps-Booth corporation, no<sup>1</sup> par stock was acquired in exchange for 3,812 shares of the Chevrolet Motor Company of Canada, Ltd., the McLaughlin Carriage Company, Ltd., and the balance of the stock of the McLaughlin Motor Car Company, Ltd., were purchased for which was paid 49,000 shares of common stock and \$550,000 cash.

(5) On December 31, all the assets of the United Motors Corporation were acquired for which was paid 298,692 shares of debenture stock (par \$100), 99,564 shares of common stock, 106,000 shares of United Motors Corporation stock acquired through the Chevrolet purchase, and cash equivalent to dividends on the common and debenture stocks since October 1, 1918; all the capital stock (preferred and common) of the Lancaster Steel Products Company, paying therefor 16,175 shares of common and 5,000 shares of debenture; and also all the preferred stock (par value \$387,100) of the Harrison Radiator Corporation, for which was paid 3,871 shares of common stock and \$38,710 cash.<sup>2</sup>

1. This, added to the Scripps-Booth stock acquired by the Chevrolet Motor Company, was a controlling interest.

2. Moody's Industrials, 1919, p. 1609.

Commercial & Financial Chronicle, Vol. 110, p. 171.

Three changes in the capital stock structure have been made since 1918. (1) On June 12, 1919, the authorized capital stock was increased from \$370,000,000 to \$1,020,000,000 consisting of \$500,000,000 six per cent debenture stock, \$500,000,000 common stock (par \$100), and \$20,000,000 of six per cent preferred stock. (2) On January 6, 1920, the structure was changed to include the following: (a) 200,000 shares of six per cent preferred (par \$100), (b) 900,000 shares of six percent debenture (par \$100), (c) 5,000,000 shares of seven per cent debenture (par \$100), and (d) 50,000,000 shares of no par value stock. (3) In June, 1924, the structure was again altered so that the outstanding capital stock now (1925) consists of these four classes: (a) \$102,250,800 seven percent preferred stock, (b) \$2,795,300 six per cent preferred stock, (c) \$4,869,900 six per cent debenture stock, and (d) 5,161,599 shares of common, no par value stock, carried on the books at \$50 per share.

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1. Commercial & Financial Chronicle, Vol. 108, p. 2437.

2. Ibid., Vol. 110, p. 171.

3. Annual Report, General Motors Corporation, Dec. 31, 1924. p. 17.

Until Dec. 31, 1924, the privilege of converting the six per cent debenture stock into seven per cent preferred stock was extended to shareholders. On June 16, 1924, the stockholders voted to replace the 20,646,397 shares of no par stock outstanding with a new issue of 5,161,599 shares of no par value common stock. The old issue was carried on the books at \$10 per share and the new issue is carried at \$50 per share; thus, \$51,615,990 of the surplus account was capitalized.

The minor changes in the Corporation after 1918 become so numerous that it will not be attempted to include them all. Those which are of most importance follow:

(1) The General Motors Acceptance Corporation was incorporated on January 29, 1919, under the banking laws of the state of New York "to finance foreign and domestic wholesale and retail sales of the products of General Motors Corporation".<sup>1</sup> The work of this corporation has been very extensive since its organization. It had financed more than 565,000 cars and trucks under its wholesale plan up to June 30, 1924.<sup>2</sup>

(2) In March, 1919, the physical assets of the Interstate Motor Company of Muncie, Indiana were purchased.<sup>3</sup>

(3) The General Exchange Corporation, a subsidiary of General Motors, was incorporated in Delaware, April 10, 1919. It was organized as an insurance company to insure General Motors cars and used cars of other makes sold by General Motors dealers.<sup>3</sup> All of its outstanding capital stock was owned by the General Motors Acceptance Corporation.

(4) In May, 1919, the Corporation took over the assets of the Michigan Crankshaft Company, Lansing, Michigan.<sup>4</sup>

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1. Commercial and Financial Chronicle, Vol. 109, p. 1613.
  2. Facts and Figures about General Motors, Sept. 1, 1924, p. 5.
  3. Automotive Industries, March 27, 1919.
  4. Ibid., April 8, 1920, p. 880.



(5) The new plant of the Saxon Motor Car Corporation<sup>1</sup> at Springwells, Michigan, was purchased in August, 1919.

(6) In October, 1919, the T. W. Warner plant at Muncie, Indiana,<sup>2</sup> and also the plant of the International Arms and Fuse Company<sup>3</sup> at Bloomfield, New Jersey were purchased.

(7) The business of the Domestic Engineering Company of Dayton, Ohio, which was engaged in the building of "Delco Light" and farm-lighting systems was acquired in October, 1919. During the same year the business of the Frigidaire Corporation, builders of an artificial-ice machine, was also purchased. The acquisition of these concerns marks the continuance of a departure in policy which became apparent in May, 1917, when the capital stock of the Samson Sledge Grip Tractor Company of California was purchased, and in June, 1918, when all the capital stock of the Janesville Machine Company of Janesville, Wisconsin, was acquired. The Corporation had previously confined its activity quite closely to the automobile industry. It was now beginning the manufacture of tractors, farm machinery suitable for use with the tractor, an artificial ice machine, and a far-lighting system.

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1. Automobile Industries, September 4, 1919, p. 496.

2. Ibid, October 16, 1919, p. 799.

3. Ibid, November 6, 1919, p. 941.

(8) Control of the Fisher Body Corporation passed to the General Motors corporation in October, 1919, when 300,000 additional shares of no par stock were issued by the Fisher corporation and purchased by General Motors at \$92 per share. Payment was made in cash. By this transaction, three-fifths of the outstanding common stock of the Fisher Body Corporation was acquired.

(9) The tractor and implement project was abandoned in April of the same year the manufacture of the Scripps-Booth automobile was discontinued. The policy of expansion came to a halt with the depression beginning in 1920, the corporation centering its efforts on more efficient internal organization. Few signs of a revival of the expansion policy were in evidence until 1924.

(10) All the outstanding capital stock of the Brown-Lipe-Chapin Company, of Syracuse, New York, which specialized in the manufacture of automobile differentials, was<sup>1</sup> acquired in December, 1922.

(11) The plant and assets of the Armstrong Spring Company of Flint, Michigan with a net value of \$1,623,186,<sup>2</sup> were purchased in January 1924.

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1. Automotive Industries, December 28, 1922, p. 1303.

2. Commercial and Financial Chronicle, Vol. 118, p. 216.

(12) A consolidation of considerable importance is pending which it seems very probable will be effected. If the plan outlined is accepted by the stockholders of the Yellow Cab Manufacturing Company on August 17, 1925, an amalgamation of this concern with the General Motors Truck Division will occur. According to the proposal, the assets of the Yellow Cab Manufacturing Company and the General Motors Truck Division will be transferred to a new corporation, the Yellow Truck and Coach Manufacturing Company. In return the General Motors Corporation will receive 800,000 shares (a controlling interest) of the common stock in the new corporation and the present shareholders of the Yellow Cab Manufacturing Company will receive the remaining portion of the capital stock in exchange for their<sup>1</sup> stock in the old company.

(13) During this period a great many small changes have occurred which have not been noted. Buildings have been constructed and remodeled, branch assembly plants have been established and subsidiary corporations have been incorporated to be responsible for some particular phase of activity. Also, many of the subsidiary and affiliated companies have expanded to a considerable degree.

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1. Commercial and Financial Chronicle, Vol. 118, p. 216.

The General Motors Corporation is today (1925) a far-flung organization whose products reach every country of importance. The following quotation is taken from a pamphlet called "Plants and Products of General Motors," published in April, 1924: "General Motors has manufacturing plants in thirty-eight cities of the United States, the Dominion of Canada and overseas. There are twenty-eight major manufacturing operations, twenty-seven sales organizations and eight miscellaneous companies; a total of sixty-three members in the General Motors family". The average number of employees in 1924 was 73,642, not including those employed in certain affiliated companies such as the Fisher Body Corporation. The average number of stockholders in 1924 was 69,229.

The following statement of the divisions, affiliated and miscellaneous companies is taken from the Sixteenth annual Report of the General Motors Corporation, December 31, 1924:

"General Motors Corporation is primarily an operating concern owning the plants, properties and other assets of its manufacturing operations which are designated in this list as Divisions. It is also a holding company owning

1. Sixteenth Annual Report of the General Motors Corporation, p. 24.

part or all of the capital stock of other companies connected with its activities. These relations are indicated by numerals appended after the name of the companies;

1. Physical assets owned by General Motors Corporation.
2. All stock owned by General Motors Corporation.
3. All common stock owned by General Motors Corporation.
4. Majority of stock owned by General Motors Corporation.
5. One-half interest owned by General Motors Corporation.
6. Physical assets owned by General Motors of Canada, Limited.
7. All stock owned by General Motors of Canada, Limited.
8. All stock owned by General Motors Acceptance Corporation.
9. All stock owned by General Motors Export Company.
10. All stock owned by New Departure Manufacturing Company.
11. Majority of stock owned by New Departure Manufacturing Company.

Passenger and Commercial Car Group.

Buick Motor Division .....	1	Flint, Michigan.
Cadillac Motor Car Division.....	1	Detroit, Michigan.
Chevrolet Manufacturing Companies.....	1 or 2	Detroit, Michigan.
General Motors Truck Division .....	1	Pontiac, Michigan.
Oakland Motor Car Division .....	1	Pontiac, Michigan.
Olds Motor Works Division .....	1	Lansing, Michigan.
General Motors of Canada, Limited .....	2	Oshawa, Ontario.

Accessory and Parts Group

Armstrong Spring Division	1	Flint, Michigan
Brown-Lipe-Chapin Division	1	Syracuse, New York
Dayton Engineering Laboratories Company	2	Dayton, Ohio
Delco-Light Company	2	Dayton, Ohio
Harrison Radiator Corporation	2	Lockport, New York
Hyatt Bearings Division	1	Newark, New Jersey
Inland Manufacturing Company	2	Dayton, Ohio.
Jaxon Steel Products Division	1	Jackson, Michigan
Lancaster Steel Products Corporation	2	Lancaster, Pa.
Muncie Products Division	1	Muncie, Indiana.
New Departure Manufacturing Company	3	Bristol, Conn.
Remy Electric Division	1	Anderson, Indiana.
Saginaw Malleable Iron Company	3	Saginaw, Michigan.
Saginaw Products Division	1	Saginaw, Michigan.
United Motors Service, Inc.	2	Detroit, Michigan.

Export and Overseas Group

General Motors Export Company	2	New York, New York
General Motors Limited	2	London, England
General Motors International A/S	2	Copenhagen, Denmark
General Motors Continental S.A.	2	Antwerp, Belgium
General Motors of Brazil S. A.	2	Sao Paulo, Brazil.

General Motors Argentina S.A. ....	2	Buenos Aires, Arg.
Delco-Remy & Hyatt Limited .....	3	London, England.
Overseas Motor Service Corporation .....	9	New York, New York

#### Affiliated and Miscellaneous Group

Fisher Body Corporation .....	4	Detroit, Michigan
General Motors Acceptance Corporation ..	2	New York, New York.
General Exchange Corporation .....	8	New York, New York.
A. C. Spark Plug Company .....	4	Flint, Michigan.
Ethyl Gasoline Corporation .....	5	New York, New York.
General Motors Building Corporation ....	2	Detroit, Michigan
General Motors Research Corporation ....	2	Dayton, Ohio.
Modern Dwellings, Limited .....	7	Oshawa, Ontario.
Modern Housing Corporation .....	2	Detroit, Michigan.
Bristol Realty Company .....	11	Bristol, Conn.
New Departure Realty Company .....	10	Bristol, Conn.

#### Sales Companies

The following sales organizations sell the products of the manufacturing units. The capital stock of these selling companies is owned by the General Motors Corporations, except in the cases noted:

Brick Motor Company.....	Flint, Michigan
Brown-Lipe-Chapin Company.....	Syracuse, New York
Cadillac Motor Car Company.....	Detroit, Michigan.

Chevrolet Sales Companies.....Detroit, Michigan  
 General Motors Truck Company.....Pontiac, Michigan  
 Hyatt Roller Bearing Company.....Newark, New Jersey  
 Jaxon Steel Products Company.....Jackson, Michigan  
 Klaxon Company <sup>c</sup> .....Anderson, Michigan  
 Oakland Motor Car Company.....Pontiac, Michigan  
 Olds Motor Works.....Lansing, Michigan  
 Remy Electric Company.....Anderson, Indiana  
 Cadillac Motor Car Company of Canada, Limited <sup>a</sup>  
 Oshawa, Ontario  
 Canadian Products, Limited <sup>a</sup> .....Oshawa, Ontario  
 Chevrolet Motor Company of Canada, Limited <sup>a</sup>  
 Oshawa, Ontario  
 General Motors Truck Company of Canada, Limited  
 Oshawa, Ontario  
 McLaughlin Motor Car Company, Limited. <sup>a</sup> Oshawa, Ontario  
 Oakland Motor Car Company of Canada, Limited  
 Oshawa, Ontario  
 Olds Motor Works of Canada, Limited... <sup>a</sup> Oshawa, Ontario  
 Delco-Light Company of Canada, Limited.. <sup>b</sup> Oshawa, Ontario

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- a. All Stock owned by General Motors of Canada, Limited.  
 b. All Stock owned by Delco-Light Company.  
 c. All stock owned by Remy Electric Company."



We will now pass to the second example of concentration, Durant Motors, Inc., which, as previously stated, has reached its present position in the industry largely by following the consolidation route.

Durant Motors, Inc.

1 Durant Motors, Inc. is primarily a holding company, the major portion of whose assets consists of the stock of a group of independently financed corporations which manufacture and assemble the product. In a letter dated July 20, 1921, Durant Motors, Inc., made the following statement concerning the status of its subsidiary companies:

"Each of these companies with respect to policy, product, operation and sales, will be controlled by the parent company which will be responsible for and assume all engineering expenses in addition to providing proper and dependable sources of material supply. For this service and the use of patents, inventions, name etc., Durant Motors, Inc. is to receive a major participation<sup>1</sup> in the profits."

It was incorporated under the laws of New York on January 13, 1921, with authorized capital stock of 1,000,000 shares of no par value, pursuant to the following:  
1. Commercial and Financial Chronicle, Vol. 113, p. 539.

ing announcement which Mr. Durant made in a letter to his friends:

"It will probably not surprise you to know that I am still an interested and firm believer in the motor industry, and that I am organizing a company controlled by myself and several of my good friends which will be in active operation by August 1, 1921<sup>1</sup>."

Mr. Durant has been a leading figure in the automobile industry since its early beginnings. As general manager of the Buick Motor Company he was largely instrumental in the organization of the General Motors Company in 1908 and was president of the General Motors Corporation from May, 1916 until his resignation in November, 1920<sup>1</sup>. It is well to note here that Mr. Durant chose a very opportune time for the organization of a new industrial concern. The precipitate fall in prices after May, 1920 resulted in the failure of many concerns and the near failure of numerous others. Hence plants, machinery, and equipment could be purchased at very reasonable prices and, further, the building of new plants at this time involved considerably less expenditure than would have been required during the upward swing of the price level.

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1. Commercial and Financial Chronicle, Vol. 112, p. 261.

On April 2, 1921, Durant Motors, Inc. was reincorporated under the laws of Delaware to manufacture and sell automobiles, parts and accessories; also to hold securities of other companies.<sup>1</sup> Two increases in the authorized capital stock have occurred: (1) in June, 1922, from 1,000,000 shares no par value to 2,000,000 shares no par value;<sup>2</sup> and (2) on May 23, 1924, from 2,000,000 to 3,000,000 shares of no par value.<sup>3</sup>

The changes, additions and consolidations which have been most significant are as follows:

(1) Shortly after the formation of the parent corporation, the Durant Motor Company of New York was incorporated with capital stock of \$3,000,000 as the first of a chain of independently organized companies to operate the assembly plants.<sup>4</sup> It purchased the plant of the Good-year Tire and Rubber Company at Long Island City, New York, in the latter part of March, 1921, for approximately \$2,000,000. Cars were to be assembled here to supply the New England and Atlantic Coast territory and the export trade.<sup>5</sup> This corporation was dissolved in January 1923 and its assets were absorbed by the Durant Motor company of New Jersey.<sup>6</sup>

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1. Moody's Industrials, 1925, p. 1475.

2. Ibid., 1923, p. 1028.

3. Commercial and Financial Chronicle, Vol. 118, p. 2577.

4. Ibid., Vol 112, p. 1403.

5. Automotive Industries, March 31, 1921, p. 726.

6. Automotive Industries, January 4, 1923, p. 48.

(2) The Durant Motor Company of California was incorporated in May, 1921, with authorized capital stock of \$3,000,000 to operate the assembly plant to be built at Oakland, California.<sup>1</sup> Durant Motors, Inc. now (1925) receives fifty per cent of the net profits and also has a substantial stock holding.<sup>2</sup>

(3) On August 11, 1921, the Durant Motor Company of Michigan was incorporated to manufacture and sell automobiles.<sup>3</sup> The authorized capital stock was \$5,000,000. It was to have charge of the assembly plant then under construction at Lansing, Michigan.<sup>4</sup> Durant Motors, Inc. receives sixty per cent of the net profits of this company and also owns a substantial amount of the capital stock.<sup>2</sup>

(4) The Durant Motor Company of Indiana was incorporated October 21, 1921, with authorized capital stock of \$3,000,000 to take charge of the plant of the Sheridan Motor Company Division of the General Motors Corporation which was acquired in May, 1921.<sup>5</sup> This company is supervised and managed by Durant Motors, Inc., which receives sixty per cent of the net profits.<sup>3</sup>

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1. Automotive Industries, May 12, 1921, p. 1040.  
 2. Annual Report, Durant Motors, Inc., May 29, 1925.  
 3. Moody's Industrials, 1925, p. 1476.  
 4. Automotive Industries, July 21, 1921, p. 144.  
 5. Ibid., July 21, 1921, p. 144.

(5) On September 3, 1921, Durant Motors of Canada, Limited, was incorporated under the Ontario Companies Act. It controls the Canadian rights to manufacture and sell the complete line of Durant cars.<sup>1</sup> The assembly plant which it operates at Leaside, Toronto, was purchased in August, 1921, and at the time of purchase was a munition plant.<sup>2</sup> At present (1925), Durant Motors, Inc. owns one-third of the capital stock of this corporation and also receives fifty per cent of the net profits above seven per cent of the capital invested.<sup>3</sup>

(6) The Durant Motor Company of New Jersey was incorporated July 15, 1922, with authorized capital stock of \$10,000,000 (par \$10), to take charge of the assembly plant at Elizabeth, New Jersey. This plant had been bought in June from the Willys Corporation at a receiver's sale for \$5,525,000.<sup>4</sup> The absorption by this company of the Durant Motor Company of New York has been noted above. The Elizabeth plant produces Star and Durant cars for distribution in the eastern section of the United States and also supplies the export demand. Durant Motors, Inc.<sup>5</sup> owns all of the capital stock.

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1. Moody's, Industrials, 1925. p. 1476.

2. Automotive Industries, September 1, 1921, p. 447.

3. Annual Report, Durant Motors, Inc., May 29, 1925.

4. Moody's Industrials, 1925, p. 1476.

(7) On July 22, 1922, Star Motors, Inc. was formed as a Delaware corporation with authorized capital stock of 1,000,000 shares of no par. It was to have charge of the sale and distribution of Star motor cars manufactured in the plants of Durant Motors, Inc.<sup>1</sup> In May, 1924, Durant Motors, Inc. acquired the assets of Star Motors, Inc. by an exchange of stock in the ratio of one share of the former for two shares of the latter.<sup>2 & 3</sup>

(8) The Flint Motor Company was incorporated in Michigan in July, 1922, with authorized capital stock of 1,000,000 shares no par value and \$10,000 preferred (par \$100).<sup>3</sup> It was to have charge of the new plant nearing completion in Flint, Michigan. Durant Motors, Inc. owns twenty per cent of the outstanding capital stock and receives fifty per cent of the net profits.<sup>4</sup>

(9) On October 17, 1922, the Locomobile Company of America was incorporated in New York with authorized capital stock of 600,000 shares no par value.<sup>5</sup> The property and assets of the old Locomobile Company which had been purchased for \$1,750,000 by Durant Motors, Inc. at a receiver's sale were transferred to this corporation by the trustees.<sup>5</sup> It controls by contract the supervision

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1. Moody's Industrials, 1923, p. 1028
  2. Commercial and Financial Chronicle, Vol. 118, p. 2309.
  3. Moody's Industrials, 1925, p. 1475.
  4. Annual Report, Durant Motors, Inc., May 29, 1925.
  5. Automotive Industries, November 2, 1922, p. 896.

and management of the Flint Motor Company, Flint, Michigan, for which it receives a share of the net profits and it controls by stock ownership the Mason Motor Truck Company, Flint, Michigan. Durant Motors, Inc. owns all<sup>1</sup> the capital stock.

(10) The New Process Gear Company, Inc. was formed as a Delaware corporation on November 17, 1922, with authorized capital stock of 800,000 shares of no par value. It was created to take charge of the operation of the plant and assets of the New Process Gear Company, formerly a subsidiary of the Willys Corporation, which were bought by Durant Motors, Inc. for \$2,100,000 at a receiver's sale early in November. In September, 1924, it acquired the Adams Ake Company and the Findlay Engineering Manufacturing Company, Findlay, Ohio.<sup>2</sup> These plants build differential gears and axles for the various assembly divisions of Durant Motors, Inc., and also fill<sup>3</sup> a considerable volume of outside contracts.

(11) On November 17, 1922, the Hayes-Hunt Corporation was formed under the laws of Delaware with authorized capital stock of 1,000,000 shares of no par value.<sup>4</sup> It furnishes closed bodies for the Durant line and also supplies certain outside sources. Durant Motors, Inc.

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1. Moody's Industrials, 1925, p. 1476.

2. Moody's Industrials, 1925, p. 1476.

3. Annual Report, Durant Motors, Inc., May 29, 1925.

4. Moody's Industrials, 1925, p. 1476.

receives twenty per cent of the net profits.<sup>1</sup>

(12) Durant Motors, Limited, London, England was formed during 1922 with authorized capital stock of \$900,000. It is owned and managed by merchants controlling the sale of Durant products in the British Isles. Durant Motors, Inc. receives fifty per cent of the net profits after the dividend on the preference shares has been provided for.<sup>2</sup>

(13) The American Plate Glass Corporation was formed under Delaware laws about July, 1923, with authorized capital stock of 700,000 shares of no par. It was organized to take over the assets of the American Plate Glass Company of Kane, Pennsylvania, which were purchased in 1922.<sup>3</sup> It meets the requirements of all Durant operations and in addition supplies certain outside sources. Durant Motors, Inc. owns all the capital stock.

(14) The Warner Corporation was acquired sometime during 1922.<sup>4</sup> The plant is located at Muncie, Indiana, and its operations are confined to the manufacture of transmissions and steering gears for Durant products. All of the capital stock is owned by Durant Motors, Inc.<sup>5</sup>

It is evident from the brief financial review given

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1. Annual Report, Durant Motors, Inc., May 29, 1925.
  2. Commercial and Financial Chronicle, Vol. 116, p. 2253.
  3. Automotive Industries, July 12, 1923, p. 91.
  4. Commercial and Financial Chronicle, Vol. 116, p. 2253.



above that Durant Motors, Inc. has gained its place in the industry in a remarkably short time and largely by following the consolidation route. However, it will be noted that its financial history also contains numerous examples of the expansion of the unit itself. In its first seventeen months of production 100,000 cars and trucks were manufactured.<sup>1</sup> Production of Stars, Durants, and Elints totaled 178,000 in 1923;<sup>2</sup> 115,543 cars and trucks were manufactured in 1924; and 56,035 have been produced in the first five months of 1925.<sup>3</sup> The future success of the company is not absolutely assured but it seems quite certain that it will maintain a rather prominent place in the industry.

We will not turn our attention to the financial history of the Ford Motor Company, the great example of concentration effected, for the most part, by the expansion of the unit itself.

#### The Ford Motor Company.

The corporate history of the Ford Motor Company has been rather uneventful. Its tremendous expansion has been effected largely by reinvestment of earnings which, for the most part, have been used to add to units already

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1. Automotive Industries, March 29, 1923, p. 745.

2. Automotive Industries, January 17, 1924.

3. Annual Report, Durant Motors, Inc. Mar 29, 1925.

in existence and to enter new phases of production. In a few cases earnings have also been expended to acquire the physical assets of other corporations. In such instances the assets of the purchased corporation have been absorbed, as a rule, and its separate corporate existence has been terminated. Unlike the General Motors Corporation, Ford has made very little use of the holding company method of control. The development of the Company to its present status is marked by a constantly increasing control over both the immediate sources of supply and the primary sources of raw materials.

It was incorporated under the laws of Michigan, June 16, 1903, "to manufacture and sell automobiles".<sup>1</sup> The original capital subscribed was \$100,000 of which only \$28,000 in cash was actually paid in. Stock in the concern has always been very closely held. Mr. Ford owned twenty-five percent of the outstanding stock at the outset and by 1907 his holdings amounted to fifty-eight and one-half per cent. In September, 1919, Edsel B. Ford purchased the remaining forty-one and one-half per cent.<sup>2</sup> This Brought the ownership of all the capital stock to the Ford family.

On June 9, 1919, the Eastern Holding Company was incorporated in Delaware to deal in securities. Its name

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1. Moody's Industrials, 1915, p.1119.

2. Ibid., 1925, p. 1102.

was changed to the Ford Motor Company on July 15, 1919, and it took over the assets of the Ford Motor Company of Michigan and Henry Ford and Company, Inc., both of which were subsequently dissolved on May 29, 1920.<sup>1</sup> The new Delaware corporation was chartered "to manufacture aircraft, internal combustion locomotives, railroad cars, automobiles, trucks, tractors and allied products" and the authorized capital stock was \$100,000,000.<sup>2</sup> This reorganization centralized the Ford interests in a single company and increased the possible scope of the business.

The Ford Motor Company of Canada, Limited, was incorporated under the laws of the Province of Ontario in 1904 for \$125,000. In 1911 it was reincorporated under the laws of the Dominion of Canada and the capital stock was increased to \$10,000,000. This concern has the exclusive manufacturing and selling rights of the Ford automobile throughout the British Empire with the exception of Great Britain and Ireland. It has a subsidiary, the Ford Motor Company of South Africa, Limited, with office and assembling plant at Port Elizabeth, South Africa.<sup>3</sup> Another subsidiary, the Ford Motor Company of Australia was in process of formation in October, 1924.<sup>4</sup>

1. Henry Ford and Company, Inc. had been formed in August, 1917 to manufacture tractors.--Commercial and Financial Chronicle, Vol. 105, p. 823.
2. Moody's Industrials, 1921, p. 1519.
3. Ibid, 1925, p. 71
4. Automotive Industries, October 16, 1924, p. 700.

The Ford Motor Company, Limited, of England, was formed in 1911,<sup>1</sup> the Ford Motor Company of Trieste was formed December 1, 1922,<sup>2</sup> and the Ford Motor Company of Japan, Limited,<sup>3</sup> was incorporated in March, 1925, at Yokohama, Japan. These concerns and the Ford Motor Company of Canada, Limited, exist as individual corporations but operate under a working agreement with the Delaware corporation.

No attempt will be made to enumerate all the changes in or additions which have been made to the Ford Motor Company of the United States. Those, however, which seem to be most significant are:

(1) The Michigan Iron, Land and Lumber Company was incorporated in September, 1920, with capital stock of \$1,000,000 owned by the Ford Motor Company, to conduct iron mining and timber milling in the upper Peninsula of Michigan.<sup>4</sup> A tract of 400,000 acres of virgin timberland was purchased there in July 1920, which included 165,000 acres of hardwood timber, 100,000 acres of second growth timber and extensive iron ore deposits.<sup>5</sup> In September, 1923, the logging town of Piqueming, Michigan was ac-

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1. Automotive Industries, July 24, 1924, p. 224.

2. Ibid., July 24, 1924, p. 225.

3. Ibid., March 5, 1925, p. 475.

4. Moody's, Industrials, 1921, p. 1519.-

5. Automotive Industries, July 15, 1920, p. 138.

quired from Charles Hebard and Sons, Inc. The deal included a large sawmill, railroad and rolling stock, towing outfits, logging equipment and also 400,000 acres of timber-<sup>1</sup>land.

(2) The Detroit, Toledo and Ironton Railroad was purchased on July 9, 1920, for \$4,941,821.<sup>2</sup> At the time of purchase the property was composed of 454 miles of main track, 155 miles of side track, 85 locomotives, 3200 freight cars, 27 passenger coaches and 4 roundhouses.<sup>3</sup> This road connects with practically every transcontinental line.

(3) The Lincoln Motor Company was acquired at a receiver's sale, February 4, 1922, for \$8,000,000. On March 29, 1922, it was reorganized under the laws of Michigan with an authorized capital stock of \$15,000,000 common, all of which is owned by the Ford Motor Company.<sup>4</sup> The purchase of the Lincoln property was a distinct departure from the policy of confining production to a small, low-priced car which lends itself readily to methods of mass production. The Lincoln appeals to an entirely different class of buyers and has little in common with the Model T.

(4) In February, 1923, the Fordson Coal Company was incorporated with capital stock of \$15,000,000 to operate

1. Commercial and Financial Chronicle, Vol. 117, p. 1241.

2. Ibid., Vol. 111, p. 294.

3. Automotive Industries, July 15, 1920, p. 138.

4. Moody's Industrials, 1925, p. 1103

the Company's coal mines in Kentucky and West Virginia. The estimated coal reserve of these mines is 600,000,000<sup>1</sup> tons. In addition, extensive tracts of coal land are<sup>2</sup> owned in the Duluth and Northwest district.

(5) The Allegheny Plate Glass Company of Glassmere, Pennsylvania, was purchased in February, 1923. The plant has a capacity of between 6,000,000 and 7,000,000 square feet of plate glass annually.<sup>3</sup> In addition, the Company owns a glass plant at Highland Court and another at River Rouge, the latter having an annual capacity of 10,000,000 square feet of plate glass.

(6) The steamer, East Indian, was purchased from the Emergency Fleet Corporation in February, 1925, as the first large unit in a proposed fleet to be put into trans-Atlantic service. Edsel B. Ford has announced the intention of the Company to operate its own fleet for carrying manufactured goods to foreign branches and assembly plants. The feasibility of extending shipping has been proved by experieiment with two smaller ships, the Oneida and the Onondaga, which have been engaged in carrying parts to assembly plants along the southern coast and to South America.<sup>4</sup>

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1. Moody's, Industrials, 1925, p. 1103.

2. Automotive Industries, August 14, 1924, p. 342.

3. Commercial and Financial Chronicle, Vol. 116, p. 727.

4. Automotive Industries, February 26, 1925, p. 439.

(7) At River Rouge the Company has erected its own blast furnaces, foundry, machine shops, body plant, saw-mill, coke ovens, cement plant, locomotive repair shops, and paper mill.<sup>1</sup> A flour mill is also located there which mills the wheat from Mr. Ford's farm.<sup>2</sup> Steel mills which have been under construction should be completed by this time (August, 1925).<sup>3</sup>

(8) The Ford Motor Company has nine water power projects either completed or under construction with a total generator capacity of 50,740 horsepower. The location and generator capacity of each project follow:<sup>4</sup>

Twin Cities, Minnesota-----	24,200	horsepower.
Iron Mountain, Michigan-----	10,000	"
Green Island, New York-----	9,650	"
Hamilton, Ohio-----	5,050	"
Flat Rock, Michigan-----	940	"
Ypsilanti, Michigan-----	700	"
Nankin Mills, Michigan-----	80	"
Phoenix, Michigan-----	80	"
Plymouth, Michigan-----	40	"

(9) Certain additional miscellaneous projects should also be noted. Preparations for the extensive growing of flax are being made and acreage for this purpose is being obtained around Ovid, Michigan. Machinery for preparing the flax will be installed at this point.<sup>5</sup> Rubber trees are being planted on an 8,000 acre tract of land in the

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1. Moody's, Industrials, 1925, p. 1103.

2. Automotive Industries, April 29, 1920, p. 1030.

3. Ibid., January 1, 1925, p. 43.

4. Ibid., August 14, 1924, p. 48.

5. Ibid., February 12, 1925, p. 287.

Everglades section of Florida.<sup>1</sup> Commercial aviation, which it was announced by Mr. Ford would deal largely with interfactory mail and urgent shipments of parts, began on April 13, 1925, when the Maiden Dearborn made<sup>2</sup> a round trip flight to Chicago.

Some conception of the size and extent of the Ford organization can be gained from the above mentioned developments and attention is again called to the fact that most of the changes and additions leading to expansion have been increases in the size of the concern itself as opposed to consolidations. The Ford Motor Company operates thirty-five branches in the United States, thirty-two of which are assembly plants. Foreign branches and associated companies are located at Buenos Aires, San Paulo, Pernambuco, Montevideo, and Santiago, South America; Havana, Cuba; Yokohama, Japan; Copenhagen, Denmark; Antwerp Belgium; Manchester, England; Stockholm, Sweden; Rotterdam, Holland; Barcelona, Spain; Bordeaux, France; Trieste, Italy; Cork, Ireland; and Ford City, Ontario. Production of cars and trucks totaled 2,089,777 in 1923 and in 1924 1,993,419 were produced. This represents in both years more than one-half the total number of cars and trucks

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1. Automotive Industries, April 29, 1920, p. 1030.

2. Automotive Industries, April 16, 1925, p. 722.



manufactured in the United States. The Ford organization employed about 150,000 men in 1924 and the assets of the Ford Motor Company on December 31, 1924, aggregated<sup>1</sup> \$644,624,468.

### Vertical or Horizontal Consolidation

A fair question which arises at this point is whether the consolidation movement in the automobile industry is taking the form of vertical consolidation or horizontal consolidation. Mr. C. C. Edmunds of the University of Michigan comes to the conclusion in a study made in 1923 that the tendency in the industry is toward the integration<sup>2</sup> of the immediate sources of supply. By immediate sources of supply he refers mainly to the products of the parts industry as opposed to the primary sources of raw materials.

It would seem that this tendency is still very active. The larger concerns in the industry are depending less and less on the parts industry for the more important units which go to make up the finished product. In other words, they are choosing to make the added fixed investment which is necessary in order to be independent of the parts makers for the more essential units. The

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1. Moody's Industrials, 1925, p. 1103.

2. American Economic Review, Vol. 13, p. 422.

General Motors Corporation and Durant Motors, Inc. furnish an illustration of such tendency by the gradual increase in the scope of the activity of their parts and accessory companies. The proportion of purely Assembled cars will, in all probability, diminish from year to year.

It also seems evident that there is little disposition among concerns other than the Ford Motor Company to carry the process of integration further than the immediate sources of supply. No other concern owns its own coal and iron mines, land and water transportation facilities, steel mills, timber tracts and saw mills. The plate glass factories of Durant Motors, Inc. and the General Motors Corporation seem to be the nearest approach to integration of the sources of raw material among the other concerns of the industry. Due to the fact that the automobile industry of the future calls for so many different types of raw material, complete integration is obviously impracticable.

Nickel, Zinc, wool, lumber and many other raw materials are not used in sufficient quantities to warrant control of the sources of supply. Further, the industry must continue to depend on other industries to supply

certain manufactured articles which are not used in sufficient quantities to permit the most economical production by the industry itself.

The conclusion of the writer is that the automobile industry of the future will be confined largely to the one stage of production, that it will slowly encroach upon the operations of the parts industry of today, but will never entirely eliminate it. Consolidation of the future will partake of the nature of integration in so far as integration of the immediate sources of supply may be classed as such. Further than this, consolidation will be principally of the horizontal type.

A possible direction of growth of the horizontal type lies in the consolidation of concerns whose products are in different price classes with a view to the creation of an establishment which offers the public a car in each price class. Both the General Motors Corporation and Durant Motors, Inc. seem to have adopted this policy at present. The former offers to buyers the Cadillac, Buick, Oakland, Oldsmobile and Chevrolet. The latter offers, the Locomobile, Flint, Durant and Star. Such a policy would seem to be advantageous from a marketing standpoint in that the dealer is not confined to one class of buyers.

No matter what the direction or type, the advantage of consolidation must seem quite obvious before the stockholders of the concerns involved can be convinced that the step is beneficial. Even after the advantage is recognized, it is extremely difficult to draw an agreement which meets with the approval of each concern. Every successful company is jealous of its name, officers and product. In spite of this resistance, consolidations of importance will undoubtedly be a future development.

## CHAPTER IV

## CAUSES OF CONCENTRATION

The causes which are responsible for the gradual increase in the size of the average establishment in the automobile industry are, for the most part, very nearly identical to those leading to the general concentration movement which has been apparent in those industries engaged primarily in manufacturing. They may be summarized as follows: (1) advantages in marketing, (2) economies in buying, (3) economies in the use of specialized machinery, (4) economy of skill, both manual and managerial, and (5) the fact that relatively lower reserves of raw materials and finished products are possible in the large concern.

The marketing advantages enjoyed by the large automobile concern have been one of the leading causes of the concentration movement in the past, and, in the writer's opinion, will prove to be the most effective cause of the progression of the tendency in the future. They seem to outweigh at present the effort to realize the economies of large scale production, which previously were doubtless the most potent factor. After a con-

cern has reached a size which makes possible a maximum of economy in production, marketing advantages may still be realized by the development of a more widely distributed organization and an increase of resources.

As sales resistance increases or, in other words, as a buyer's market replaces the sellers' market which has been characteristic of the past, the manufacturing concern must give more and more attention to the problems of marketing. Rigid economies must be instituted in this phase as well as in the production phase in order that the product may reach the consumer with a minimum of expense above that of actual production. No concern can afford to lose the advantage of a high degree of production efficiency through wasteful marketing methods. The marketing advantages of the large concern follow:

(1) A strong dealer organization carrying out uniformly the policy of the manufacturing concern is the first essential of economical marketing. The buyer does not come in contact with the factory or its officials. His transactions are with the dealer and his opinion of the concern is formed mainly by the character of the treatment he receives. The dealer organization carries a tremendous responsibility. The finest factory product may

fail to give satisfaction unless upright, efficient and adequate service is available during the life of the automobile. If the buyer feels that his car or truck has given satisfaction, that he has been dealt with squarely, and that the concern is strong and dependable, it is very probable that he will seek no change when he buys again. On the other hand, if his automobile fails to give satisfaction, if service is inadequate, and he feels the dealer has attempted to take advantage of him, he will be very reluctant to deal again with that concern.

The development of a strong and efficient dealer organization is at best a slow and expensive process. The resources of the small concern are obviously inadequate to give proper attention to this phase and it is consequently placed at a distinct disadvantage.

(2) The large concern is able to analyze and sound out market conditions with more precision. As the resistance to sales increases the manufacturer must know as much or more about the dealer's territory as the dealer himself. The factory cannot afford to rely on the dealer's estimate of the potentialities of his territory. Chief executives must sound out each territory and gather all possible facts for use both in the preparation of produc-

tion schedules and in testing the efficiency of the dealer. For this purpose adequate and efficient statistical departments must be maintained.

The above is particularly true of the foreign market. As the United States market approaches a replacement basis, American producers must turn to the foreign market to absorb the surplus of motor vehicles which is inevitable if factories continue to operate at capacity. Increasing competition from foreign manufacturers may also be expected. If this outlet is to be utilized a complete knowledge of foreign conditions is essential as well as an efficient foreign sales organization. The small concern is again handicapped by inadequate resources.

(3) The resources of the large concern enable it to force the market to the limit by offering attractive terms of sale. The rapid extension of the installment selling plan may be cited as an illustration. The Ford Motor Company recently instituted a purchase plan in the Detroit area by means of which one of its models may be purchased for a down payment of \$12.40, the balance to be paid in weekly installments. Another example is the Chevrolet six per cent Purchase Certificate plan. Six



per cent interest is paid on installment payments until the payments and interest amount to one-third the retail price of the car, at which time the car is delivered. The balance is paid in installments. Sales of the product of the small concern are made the more difficult because it is unable to meet the favorable terms of sale offered by its larger and more powerful competitors.

(4) The intelligent buyer of automobiles places a premium on the product of the large establishments with a widely distributed organization. This premium is equal to (a) the value to the buyer of the assurance that he will be able to obtain service and repairs immediately at almost any point in the United States during the life of his car, and (b) the amount by which depreciation on the large concern's products is less. Thus, if the small concern sells to the intelligent buyer, either it must offer a superior quality product at the same price or the same quality product at a lower price.

The first factor is of increasing importance as the motor car is used more extensively for touring and distance driving, both of which are becoming more common as the highway system is improved. Mr. C. A. Vane, General Manager of the National Automobile Dealers' Association

recently made the following statement:

"The buyer of a new car can not be too careful in demanding evidences of the financial stability of the company producing the automobile he contemplates owning. The buyer must look far beyond the car right under his eyes when he is in the market."<sup>1</sup>

A recent survey of the National Automobile Dealers' Association shows that there are more than 600,000 "orphan cars" owned in the United States. An "orphan car" is defined as one whose manufacturer has gone out of business. The buyer is becoming more intelligent and will discount the small concern's product, for the above reason, more in the future than he has in the past.

The second factor resulting in the premium placed on the large concern's product is mainly an outgrowth of the first. Depreciation is more rapid in the case of the small concern's product due to the difficulty of getting repairs and service beyond the immediate area of the sales organization. This point may be illustrated by a comparison of the Allen and Dodge motor cars. Sales of the Allen have been restricted mainly to Ohio and the East. Hence immediate service and repairs are difficult to obtain in

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1. Automotive Industries, June 18, 1925, p. 1077.

the West and other remote parts of the United States. The concern was forced into receivership in May, 1920,<sup>1</sup> and produced cars only intermittently until September,<sup>2</sup> 1921, when the bondholders voted to begin liquidation. Even though the Allen is a more expensive car and probably is as well designed and constructed as the Dodge, a 1918 Allen would today (1925) bring almost as much from the Junk man as on the market while a 1918 Dodge still has considerable resale value. This can be attributed to one thing only, namely, the lack of a dealer organization on the part of the Allen Motor Company to supply service and repairs at all points in the United States.

It should also be noted that the dealer representing a small manufacturer is placed in a difficult position due to the relatively low resale value of the product. He is unable to allow on trade-ins what the average car owner feels that his car is worth. This factor tends to lengthen the time which the average owner of that make of automobile will drive his machine before trading it in for a new one and consequently tends to slow up sales of new cars. It is partially offset, however, by the fact that the dealer who handles this type of product in-

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1. Automotive Industries, May 27, 1920, p. 1256.

2. Ibid., September 22, 1921.

variably receives a higher commission, relatively, than the one representing a large and well established concern. The cutting of commissions often enables him to offer more for trade-ins.

(5) Certain economies in advertising are possible to the large concern. Its resources enable it to develop this department to a point of high efficiency. Sales resistance is overcome by judicious advertising more economically than by any other method yet devised. It searches out many prospective buyers that the salesman in the field would otherwise fail to meet and also by its subtle appeal lessens the difficulty of each sale.

A concern of the type of the General Motors Corporation or Durant Motors, Inc. whose product includes automobiles of different make and design can bring each car before the public eye with greater effectiveness and less expense than separate concerns could advertise them. In some cases every car produced may be represented in one large advertisement. In others, each make may be presented separately as a product of the large concern. In the first case a substantial saving is possible and in the second case the reputation of the large and widely known establishment is attached to each make of automobile.

(6) Finally, the large concern often enjoys advantage by the maintenance of assembly plants at strategic points. Parts can be shipped at a fraction of the cost of shipping the assembled car. The small concern, being unable to maintain such assembly plants, is compelled to ship the assembled car from its factory to the most remote part of the country if sales are made at that point.

The second cause leading to concentration is the economy in buying enjoyed by the large automobile establishment. Raw materials, as well as parts and accessories which enter into the construction of the product, can almost invariably be purchased more reasonably in large quantities. The large purchaser is also very often able to secure a higher quality product than is available to the concern which buys in small quantities. The contracts of each concern with various parts-makers furnish an illustration of purchasing economies. In the case of a large contract it is usually possible to secure either a lower price per unit or finer quality at the same price.

Economies in the use of specialized machinery have been cited as the third cause responsible for the concentration tendency. A special device or machine has been designed to aid in the performance of almost every

operation in the construction of the automobile. The multiple engine block drill furnishes a good example. Before this machine was designed a separate operation was required for the drilling of every hole in the engine block. Its use reduces this previously complicated process to two or three operations by drilling all holes in the same direction at once. By the use of improved machinery of this type skilled labor is displaced, greater precision and accuracy is made possible and the productive process is greatly accelerated.

It follows that the concern which utilizes the most efficient machinery is able, other things being equal, to produce a better finished product with less expense.

Much of this machinery which is essential, if production costs are reduced to the minimum, is very expensive and its use necessitates a considerable capital outlay. Consequently a concern operates at a disadvantage either if its resources are insufficient to enable it to install the most efficient machinery or if it has installed such machinery and, due to the inadequacy of the rest of its plant and organization,

is forced to operate it on only a part-time basis. In the first case inferior methods of production must be used; in the second, the interest on capital invested in the machinery and losses from depreciation and repairs will make deep inroads into profits.

It is also true that as the output of a factory increases the use of machinery can be extended further and further to take over processes which had previously not been important enough to keep a machine busy. This factor is always present as an advantage to the large producer. Further, the resources of the large concern permit it to carry on constant experiment for the improvement of processes, the discovery of new processes and the perfecting of new devices. The research laboratories of the General Motors Corporation and the Ford Motor Company may be cited as examples.

Mr. Alfred Marshall stresses the importance of this first cause in the following quotation:

"The growth of machinery in variety and expensiveness presses hard on the small manufacturer everywhere. It has already driven him completely out of some trades and is fast driving him out of others."<sup>1</sup>

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1. Principles of Economics, p. 281.

The fourth cause responsible for the concentration tendency is economy in skill, both manual and managerial.

Economy of skill with respect to manual labor is closely akin to that derived from the use of specialized machinery. The greater the use of specialized machinery, the narrower becomes the range of tasks of each laborer, which, in turn, results in the development of a higher degree of skill in the performance of each separate task. The productive process is accelerated in proportion as the degree of skill is increased. Some idea of the increase in the efficiency of labor can be gained by recalling the figures set forth on page 2. In 1899, 1.6 automobiles per wage earner employed were produced. In 1923, 16.9 automobiles per wage earner employed were turned out. This marked increase is traceable to more efficient management and the use of machinery, as well as to increased efficiency of labor. However, the last factor has undoubtedly been very important.

A further economy of skill as possible in the large concern with respect to management. It has a better opportunity to choose men of the highest calibre and



natural ability as foremen and heads of departments. The management of a large establishment should also be able to determine with greater precision the policy which will result in the largest net profits. This should be the case both because its large resources enable it to maintain more efficient and thorough statistical departments and because the managing staff is, as a rule, of higher calibre.

The fifth cause leading to concentration needs little elaboration. Every operating automobile factory must maintain a certain reserve of raw materials and finished products to meet contingencies, but such reserves required in the large concern are relatively less than in the small concern. This factor is of most significance in retail trade but it applies in less degree to a manufacturing industry. It is of less importance than the others which have been pointed out, yet a saving is possible from this source.

In conclusion it should be noted that while the factors discussed above leading to a greater degree of concentration are constantly at work, there are other opposing factors which tend to offset them and limit the size of the average establishment. There is a

limit beyond which the increase in the physical size of the plant will result in loss rather than gain, and also there is a limit to the capacity of chief executives to efficiently manage one organization. After a certain point is reached inefficiencies are bound to creep in due to the remoteness of the management from the actual factory processes. It is apparent from the facts set forth in Chapter II that this point has not yet been reached by the average concern in the automobile industry. Obviously the first set of factors has thus far outweighed the second set. The beam of the balance is constantly tending to right itself and perhaps the indicator will eventually even swing slightly to the opposite side, signifying that the influence of the second set of factors has offset and outweighed the influence of the first. In this case new concerns more nearly the most economical size will tend to replace the old establishments which have grown too large to attain a maximum of efficiency. The keenness of business men in their constant and ceaseless struggle for profits will no doubt ultimately secure a rather finely drawn adjustment. It is indeterminable just how far the concentration tendency is destined to go before the size of maximum efficiency is attained. Time alone can reveal this fact.

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